PROJECT MANUAL

for construction of

Café Express

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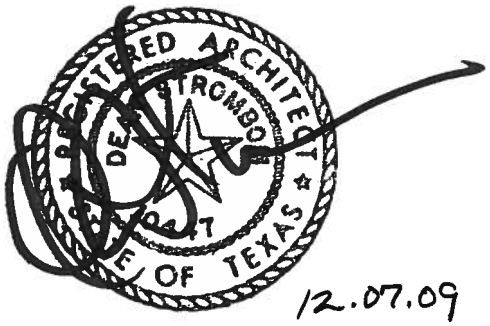

Sealing Architect's Name: Dean H. Strombom, AIA
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SECTION 00 72 00 – GENERAL CONDITIONS

PART 1 - GENERAL

1.1 General Conditions of the Contract for Construction, Gensler Document GCi which incorporates and amends AIA Document A201, 1987 Edition, hereinafter referred to as General Conditions, are hereby made a part of this Specification.

1.2 The Contractor is hereby specifically directed, as a condition of the Contract, to acquaint himself with the Articles contained therein, and to notify and apprise all Subcontractors and any other parties to the Contract of, and bind them to, its conditions.

1.3 No contractual adjustments shall be due as a result of failure on the part of the Contractor, Subcontractors or other parties to the Contract to fully acquaint themselves with the General Conditions.

1.4 The General Conditions of the Contract may be amended by Supplementary Conditions.

1.5 The provisions of the General and Supplementary Conditions when included and Division 01, General Requirements, apply to the Work specified in each Section of the Specifications.

1.6 Where conflicts occur concerning the Architect's duties and responsibilities between the General Conditions and the Agreement between the Owner and Architect, the Agreement shall take precedence.

1.7 If not otherwise included in the Owner Contractor Agreement or specifically included in the bidding documents, the Contractor shall obtain the Owner’s insurance requirements prior to submitting a bid.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 72 00

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION (GCi)

Gensler

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, *schedules,* 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 Architect. W*hen executed as part of the Agreement,, bond forms are part of the Contract Documents*. 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, Contractor's bid or portions of addenda relating to bidding requirements).

1.1.2 The Contract. The Contract Documents form the Contract for Construction *(hereinafter the Contract)*. 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 Architect and Contractor or *any other person or entity* (2) between Owner and a Subcontractor or Sub-subcontractor or (3) between any persons or entities other than Owner and Contractor. Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of 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 Contractor to fulfill Contractor's obligations. The Work may constitute the whole or a part of Project. *Notwithstanding the inclusion of "Services" in the meaning of Work, Architect shall have no responsibility for or control over the means, methods or sequences of construction, as set forth in Subparagraph 4.2.3. Nor shall such definition of "Work" be construed to extend the responsibilities or services of Architect beyond those set forth in Owner/Architect Agreement.*

1.1.4 Project. 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 Owner or by separate contractors.

1.1.5 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, 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, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.7 Project Manual. Project Manual is the volume which may be assembled for the Work and which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.1.8 Other Definitions.

.1 *"Equal", "accepted equal", and "approved equal" shall mean as accepted, in writing, by Architect as being of equivalent quality, utility, and appearance.*

.2 *"By Owner" refers to work which will be performed by Owner or his/her agents at Owner's cost.*

.3 *"By others" refers to work which is not a part of the Contract.*

.4 *"Furnish" shall mean supply only, do not install.*

.5 *"Install" means install only, do not furnish.*

.6 *"Provide" means furnish and install.*

.7 *The term "as required" shall mean as required by regulatory bodies, by referenced standards, by existing conditions, by generally accepted construction practice, or by the Contract Documents.*

.8 *\ The term "Client" may be used synonymously with the term "Owner".*

1.2 Execution, Correlation And Intent

1.2.1 The Contract Documents shall be signed by Owner and Contractor as provided in the Agreement. If either Owner or Contractor or both do not sign all the Contract Documents, Architect shall *assist in* identify*ing* such unsigned Documents upon request.

1.2.2 Execution of the Contract by Contractor is a representation that Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. *Additionally, Contractor acknowledges and agrees that the information contained in the Contract Documents is adequate and sufficient for completion of the Work subject to the provisions of Subparagraph 3.2.1.*

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by Contractor shall be required \ to the extent \ inferable from them as being necessary *for a contractor experienced and expert in this type of construction* to produce the intended results.

1.2.4 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. *The inclusion, for convenience in pricing, bidding, permit application, construction or other purposes, of documents prepared by entities other than Architect or its consultants with documents prepared by Architect or its consultants shall not imply that Architect has reviewed, approved or is responsible for their accuracy or completeness.*

1.2.5 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.

1.2.6 *Conflicts or discrepancies among the Contract Documents shall be resolved in the following order of priority:*

.1 *Amendments and revisions (such as Change Orders) of later date take precedence over those of earlier date;*

.2 *the Agreement;*

.3 *the Supplementary Conditions;*

.4 *the General Conditions;*

.5 *Drawings and Specifications; Drawings govern Specifications for quantity and location. Specifications govern Drawings for quality and performance. In the event of ambiguity or conflicts, the greater quantity and the better quality shall govern.*

1.3 Ownership And Use Of Architect's Drawings, Specifications And Other Documents *and Data*

1.3.1 The Drawings, Specifications and other documents *(collectively "Documents") and any computer tapes, disks or CAD files (collectively "Data")* prepared by Architect *and its consultants and agents* are instruments of \ service through which the Work to be executed by Contractor is described. Contractor may retain one contract record set. Neither Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the \ *Documents and/or Data, and Architect* shall be deemed the author of \ *them and shall* retain all common law, statutory and other reserved rights, *including any copyrights embodied therein.* All copies of the \ *Documents and/or Data*, except Contractor's record set, shall be returned or suitably accounted for to Architect, on request, upon completion of the Work. The \ *Documents and/or Data* and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor, 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 Owner and Architect. Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the \ *Documents and/or Data* appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this license shall bear the statutory copyright notice, if any, shown on \ *them*. 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 Architect's copyright or other reserved rights. *In the event of any unauthorized use, reuse, or modification to Documents and/or Data by Contractor, any lower tier contractor or material supplier, or other person or entity under Contractor's direct or indirect employ, Contractor agrees to indemnify, defend and hold Owner, Architect, their officers, directors, shareholders, employees, agents, and consultants harmless from and against any and all claims, liabilities, suits, demands, losses, damages, costs and expenses, including, but not limited to, reasonable attorneys' fees and all legal expenses and fees incurred through appeal, and all interest thereon, accruing to or resulting from any and all persons, firms, or any other legal entities on account of any damages or losses to property or persons, including, but not limited to, injuries or death or economic losses arising out of 1) such unauthorized use, reuse, or modification of Documents, 2) any transfer, use, reuse or modification of any Data provided by Architect to Contractor or others, except where Architect is found to be solely liable as between the parties hereto as well as between any other persons, firms or other legal entities for such damages or losses by a court or forum of competent jurisdiction.*

1.3.2 *Architect shall be compensated for any Data agreed in writing to be released.*

.1 *The transfer of Data is not and shall not be deemed as a sale. The Data are instruments of professional service, and as such, Architect makes no representations or warranties, expressed or implied, of its merchantability or fitness for a particular purpose with respect to its quality, adequacy, completeness or sufficiency as to any results to be or intended to be achieved as to its use.*

.2 *Contractor's use of the Data shall be limited as set forth by Architect. Contractor agrees that the Data shall not be used for any other purpose or transferred to others without Architect's prior written consent.*

(a) For the purpose of this Agreement, Contractor has permission to transfer the Data to its Subcontractors, Suppliers and Consultants on Project ("Others") for their use in preparation of shop drawing submittals and other services on Project, under their Agreements with Contractor. Contractor agrees to obligate the Others in writing to be bound to the terms of this Agreement as if the Others were Contractor in this Agreement.

(b) Contractor is obligated to verify all dimensions indicated on the Data. Contractor agrees to obligate the Others to verify all dimensions indicated on the Data.

(c) Architect does not represent that all information contained in the Data is complete, noting that there could be subsequent changes to the Data. Furthermore, items shown in the Data may not be to scale.

.3 *Contractor acknowledges that anomalies and errors can be introduced into the Data when it is transferred or used in an incompatible computer environment. Further, Contractor acknowledges and solely accepts the risks associated with and/or the responsibility for any damages to hardware, software or computer systems or networks related to any use of the Data. The Data is being furnished "as is". Contractor hereby releases Architect from any damages or losses of any kind, including, but not limited to, damages or losses to property or persons, including, but not limited to, death, or economic losses, or any consequential, special, indirect or incidental damages, arising out of the transfer or use of the Data.*

.4 *Contractor and the Others are responsible for modifying their computer systems to properly use the Data. Architect shall have no duty to modify or update the Data and Architect reserves the right to retain an archival copy of the Data delivered to Contractor which shall be referred to and shall be conclusive proof and govern in all disputes over the form or content of the Data furnished to Contractor.*

.5 *If Contractor fails to perform or observe any of the terms herein stated, Architect may demand and Contractor shall immediately return the Data and any copies thereof.*

1.4 Capitalization. Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs and Clauses in the document or (3) the titles of other documents published by the American Institute of Architects or other body.

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

Article 2 - Owner

2.1 Definition

2.1.1 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 term "Owner" means Owner or Owner's authorized representative.

2.1.2 Owner upon reasonable written request shall furnish to Contractor in writing a correct statement of the record legal title to the property on which Project is located, Owner's interest therein at the time of execution of the Agreement and, within five days after any change, information of such change in title, recorded or unrecorded.

2.2 Information And Services Required Of Owner

2.2.1 Owner shall, at the request of Contractor, prior to execution of the Agreement \ furnish to Contractor reasonable evidence that financial arrangements have been made to fulfill Owner's obligations under the Contract.

2.2.2 Owner shall furnish surveys or other required information describing physical characteristics, legal limitations and utility locations for the site of Project, and a legal description of the site.

2.2.3 Except for permits and fees which are the responsibility of Contractor under the Contract Documents, 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.

2.2.4 Information or services under Owner's control shall be furnished by Owner with reasonable promptness to avoid delay in orderly progress of the Work.

2.2.5 Unless otherwise provided in the Contract Documents, Contractor will be furnished, free of charge, such copies of Drawings and Project

Manuals as are reasonably necessary for execution of the Work. Additional copies shall be furnished at cost.

2.2.6 The foregoing are in addition to other duties and responsibilities of Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion) and Article 11 (Insurance and Bonds).

2.3 Owner's Right To Stop The Work. If Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or \ fails to carry out Work in accordance with the Contract Documents, Owner, by written order signed personally or by an agent specifically so empowered by Owner in writing, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of Owner to stop the Work shall not give rise to a duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

2.4 Owner's Right To Carry Out The Work. If 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 Owner to commence and continue correction of such default or neglect with diligence and promptness, \ Owner may, without prejudice to other remedies Owner may have, correct such deficiencies. \ *Owner may offset* from payments then or thereafter due Contractor the cost of correcting such deficiencies, including compensation for Architect's additional services and expenses made necessary by such default, neglect or failure. \ If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the difference to Owner.

Article 3 - Contractor

3.1 Definition. 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 Contractor or Contractor's authorized representative.

3.2 Review Of Contract Documents And Field Conditions By Contractor

3.2.1 Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by Owner pursuant to Subparagraph 2.2.2 and shall at once report to Architect errors, inconsistencies or omissions discovered *or any variance from applicable laws, codes or regulations*. Contractor shall \ be liable \ for damage resulting from \ *Contractor's failure to report such discovery or its performance of any construction activity if it knows or should have known of such error, inconsistency, omission or violation.*

3.2.2 Contractor shall, *sufficiently in advance of undertaking the Work*, take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to Contractor with the Contract Documents. \ Errors, inconsistencies or omissions discovered shall be reported to Architect at once. *If Contractor performs any construction activity which involves an error, inconsistency or omission which Contractor knew of or should reasonably have known of, without notice to Architect, Contractor shall assume responsibility for such performance and shall bear all costs of correction.*

3.2.3 Contractor shall perform the Work in accordance with the Contract Documents and submittals \ pursuant to Paragraph 3.12.

3.2.4 *Prior to starting the Work and with sufficient lead time to avoid any job schedule impacts, Contractor shall review any specified construction and installation procedures and shall advise Architect prior to commencing related activities if any such procedures would result in finished Work that would not be in conformance with the intent of the Contract Documents.*

3.3 Supervision And Construction Procedures

3.3.1 Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over *construction means*, methods, techniques, sequences and procedures *including safety programs and procedures*, and for coordinating all portions of the Work under the Contract. \

3.3.2 Contractor shall be responsible to Owner for acts and omissions of Contractor's employees, Subcontractors and their agents and employees, and other *persons or entities directly or indirectly employed by them* performing portions of the Work under a contract with Contractor.

3.3.3 Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents *nor shall Contractor's liability be diminished* either by activities or duties of Architect in Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than Contractor.

3.3.4 Contractor shall be responsible for inspection of portions of Work already performed under this Contract, *as well as existing conditions,* to determine that such \ are in proper condition to receive subsequent Work.

3.4 Labor And Materials

3.4.1 Unless otherwise provided in the Contract Documents, Contractor shall *in a timely manner so as to not delay the progress of the Work* 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 Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Contract. Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.4.3 *Where substitutions of materials or equipment is permitted by the Contract, request for such substitution shall be made in a timely manner in full compliance with Contract requirements.*

3.4.4 *In making a request for substitution, Contractor represents that*

.1 *Contractor has investigated the proposed substitution and has determined that it is equal to or superior in all respects to that specified, including warranties.*

.2 *that the cost data presented with the request for substitution is complete and includes all costs of labor, materials, equipment, profits and overhead as well as any costs required to adapt and/or coordinate the substitution with adjacent or existing construction.*

3.5 Warranty. Contractor warrants to 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 \ and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, *shall* be considered defective. Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by *Owner or* Architect, Contractor shall furnish satisfactory evidence *including certifications when requested* as to the kind and quality of materials and equipment.

3.6 Taxes. Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by 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, 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 Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities bearing on performance of the Work.

3.7.3 It is not 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 Contractor observes *or should have observed as an experienced contractor* that portions of the Contract Documents are at variance therewith, Contractor shall promptly notify Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If Contractor performs Work \ *which it knows or in the ordinary course of business as an experienced contractor* ***should have known*** it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to Architect and Owner, Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

3.8 Allowances

3.8.1 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 Owner may direct, but Contractor shall not be required to employ persons or entities against which Contractor makes reasonable objection.

3.8.2 Unless otherwise provided in the Contract Documents:

.1 materials and equipment under an allowance shall be selected promptly by Owner to avoid delay in the Work;

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

.3 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 and not in the allowances;

.4 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 Clause 3.8.2.2 and (2) changes in Contractor's costs under Clause 3.8.2.3.

3.9 Superintendent. Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at Project site during performance of the Work. *The superintendent shall be approved by Owner and shall not be replaced without Owner's prior approval. The superintendent shall be familiar with the job site, the Contract Documents, and all applicable rules, regulations and requirements of all authorities having jurisdiction over the Work or the site.* The superintendent shall represent Contractor, and communications given to the superintendent shall be as binding as if given to Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on \ request in each case, *and as set forth in Subparagraph 4.2.4.*

3.10 Contractor's Construction Schedules

3.10.1 Contractor, promptly after being awarded the Contract, shall prepare and submit for Owner's and Architect's information a Contractor's construction schedule for the Work. \ *Such schedule shall be a computer generated critical path method (CPM) schedule showing at a minimum,*

.1 *the early and late start time for each major construction activity;*

.2 *all "critical path" activities and their duration;*

.3 *late order dates for all long lead time materials and equipment;*

.4 *critical owner decision dates.*

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 Contractor shall, *in consultation with Architect*, prepare and keep current, for Architect's approval, a schedule of *required* submittals which is coordinated with Contractor's construction schedule and allows Architect reasonable time to review submittals.

3.10.3 Contractor shall conform to the most recent schedules.

3.10.4 *Failure of Contractor to submit or keep current the construction schedule and submittals schedule as required by the conditions of the Work, shall be grounds for withholding of payments due Contractor by Owner, until such schedules are provided.*

3.11 Documents And Samples At The Site. Contractor shall maintain at the site for Owner one record copy of the Drawings, Specifications, addenda, Change Orders and other Modifications, *as well as one copy of the approved permit set,* in good order and marked currently to record changes and selections made during construction, and in addition *reviewed* Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to Architect and shall be delivered to Architect for submittal to Owner upon completion of the Work.

3.12 Submittals

3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by 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 Contractor to illustrate materials or equipment for some portion of the Work.

3.12.3 Samples are physical examples *furnished by Contractor* 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 submittals is to demonstrate for those portions of the Work for which submittals are required the way *that* Contractor proposes to conform to the \ v*isual and aesthetic* design concept expressed in Architect's Drawings and Specifications. Review by Architect is subject to the limitations of Subparagraph 4.2.7.

3.12.5 Contractor shall review, approve and submit to Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents. Contractor shall provide Submittals to Architect with reasonable promptness and \ *in accordance with the approved submittal schedule as set forth in Subparagraph 3.10.2, so* as to cause no delay in the Work or in the activities of Owner or of separate contractors, *and Contractor shall highlight all changes to the Contract Documents and/or previous submittals*. Submittals made by Contractor which are not required by the Contract Documents may be returned *by Architect* without action.

3.12.6 Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been \ *reviewed and returned* by Architect. Such Work shall be in accordance with *reviewed* submittals. *If more than one of Architect's or its consultant's submittal review stamps appears on a Submittal, the most stringent action and notations thereon shall apply. Signature on a submittal review stamp by Architect or a consultant does not imply that it has reviewed work not within its professional discipline or scope of services.*

3.12.7 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, Contractor represents that 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. *Incomplete, uncoordinated or incorrect Shop Drawings and other submittals shall be returned to Contractor, who shall be held responsible for all time delays and extra costs of review or handling by Architect or Owner, because of such submittals being incomplete, uncoordinated or incorrect.*

3.12.8 Contractor shall not be relieved of responsibility for deviations *or omissions* from requirements of the Contract Documents by Architect's *review* of Shop Drawings, Product Data, Samples or similar submittals unless Contractor has specifically informed Architect in writing of such deviation *or omission* at the time of submittal and Architect has given written approval to the specific deviation *or omission*. Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by Architect's \ *review or action thereon*.

3.12.9 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 Architect on previous submittals.

3.12.10 \ *Submittals shall not be used as a substitution for Change Orders or other procedures required by the Contract Documents, and shall not constitute approval or authorization for change in the Contract Documents, which change may be made only through an approved Change Order or Directive in accordance with Subparagraph 7.1.*

3.12.11 When \ certification of performance criteria of materials, systems or equipment is required by the Contract Documents, Architect *and Owner* shall be entitled to rely upon the *authenticity,* accuracy and completeness of such calculations and certifications.

3.13 Use Of Site. 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. *For purposes of this provision, "site" shall include all existing structures.*

3.14 Cutting And Patching

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

3.15 Cleaning Up

3.15.1 Contractor shall *at all times* 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 Contractor shall remove from and about Project waste materials, rubbish, Contractor's tools, construction equipment, machinery and surplus materials.

3.15.2 If Contractor fails to clean up as provided in the Contract Documents, Owner may do so and the cost thereof shall be charged to Contractor.

3.16 Access To Work. Contractor shall provide Owner and Architect access to *all portions of* the Work in preparation and progress wherever located.

3.17 Royalties And Patents. Contractor shall pay all royalties and license fees. Contractor shall defend suits or claims for infringement of patent rights and shall hold 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. However, if Contractor has reason to believe that the required design, process or product is an infringement of a patent, Contractor shall be responsible for such loss unless such information is promptly furnished to Architect.

3.18 Indemnification

3.18.1 \ Contractor shall indemnify, *defend* and hold \ Owner, Architect, \, *their officers, directors,* shareholders, employees, agents, and *consultants* \ *harmless* from and against any and all claims, *liabilities, suits, demands*, \ losses, *damages, costs* and expenses, including, but not limited to, *reasonable* attorneys' fees, *and all legal expenses, and fees incurred through appeal, and all interest thereon, accruing to or resulting from any and all persons, firms or any other legal entities on account of any damages or losses to property or persons, including, but not limited to, injuries or death or economic losses* arising out of \ performance of the Work, \ *whether* caused in whole or in part by \ *the performance or nonperformance* of 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 claims*, liabilities, suits, demands,* \ loss*es, damages, costs,* or expenses \ *are* caused in part by a party indemnified hereunder *to the extent such has been finally adjudicated*. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity \ *that* would otherwise exist as to a party or person described in this Paragraph 3.18. *The above indemnification shall survive completion or termination of the Work.*

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

3.18.3 The obligations of Contractor under this Paragraph 3.18 shall not extend to the *extent of proven* liability of Architect, Architect's consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by Architect, Architect's consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

3.19 Year 2000.

3.19.1 *To the extent that equipment, systems, components or assemblies ("Equipment") that incorporate or rely upon electronic date-dependent hardware or software are specified or indicated in the Contract Documents by propriety information, performance criteria, or both, Contractor shall immediately notify Architect if:*

.1 *Any such Equipment is not designed to be used during or after the calendar year 2000 AD or that any such Equipment will not operate during each such time period without error relating to date data, specifically including any error relating to, or the product of, date data which represents or references different centuries or more than one century.*

.2 *Without limiting the generality of the foregoing, Contractor agrees to notify Architect in writing if any such Equipment:*

(a) Will abnormally end or provide invalid or incorrect results as a result of date data, specifically including date data which represents or references different centuries or more than one century;

(b) Has not been designed to ensure year 2000 compatibility, including, but not limited to, date-data century recognition, calculations which accommodate same century and multi-century formulas and date values, and date-data interface values that reflect the century; or

(c) Does not include "Year 2000" Capabilities". For the purposes of this Section, "Year 2000 Capabilities" means the Equipment:

- *Will correctly process date-related-data outside the range 1900 - 1999 in any level of electronic hardware or software including, but not limited to, application programs, files, and databases;*

• Will manage and manipulate data involving dates, including single-century formulas and multi-century formulas, and will not cause an abnormally ending scenario or generate incorrect values or invalid results involving such dates; and

• Provides that all date related user interface functionalities and data fields include the indication of century, and

• Provides that all date-related data interface functionalities include the indication of century.

***3.19.2** Contractor shall:*

***.1** Immediately notify Architect if any Equipment is not Year 2000 Compliant; and,*

***.2** Warrant to Architect and Owner in writing that all Equipment in Project includes Year 2000 Capabilities; and,*

***.3** By including appropriate language in each of its agreements with subcontractors and suppliers, require each to warrant to Contractor in writing that all Equipment installed or supplied by that subcontractor or supplier includes Year 2000 Capabilities.*

3.20 Design/Build.. The owner's, architect's and contractor's roles relative to Design/Build work are different than when the architect, the architect's consultants and/or the owner's other consultants provide services using the traditional design-bid-build process. Design/Build is a process in which a person or entity, typically the contractor or its subcontractors, is responsible under a single contract for designing and constructing certain building systems based on guidelines (often called performance criteria) prepared by the owner or its design professionals. Often the construction documents will indicate that a particular building system (for example, the fire protection or mechanical system) will be Design/Build, however, it is not uncommon for such decisions to be made during construction.

3.20.1 If Contractor provides and/or retains its subcontractors or others to provide Design/Build Work for specified portions of the Project, Contractor shall be responsible directly to Owner for the design, technical adequacy, accuracy, installation and performance of those portions of the project including but not limited to: (1) preparing engineering and other drawings and specifications for all components of such portions of the Project, (2) complying with Project requirements and space limitations, (3) coordinating and interfacing with other trades and consultants, and (4) obtaining approvals from authorities having jurisdiction over Project. owner's other design professionals (or Contractor and/or its subcontractor(s) design professionals) shall be the Professional(s) of Record for such Design/Build portions of the Project.

3.20.2 Architect and its consultants shall have no responsibility for the design, technical adequacy or accuracy, installation or performance of any such portion(s) of the Project including but not limited to reviewing such designs and/or work and/or certifying payment applications for such. Architect's services in connection with any Design/Build portion(s) of the Project shall be limited to checking such designs for general conformance to major space limitations and the visual and aesthetic design concept as expressed in the Architect's and its consultants' Drawings and Specifications. Such checking by Architect and/or its consultants of more than two proposals for a Design/Build portion of the Project shall be compensated as Additional Services.

3.20.3 When the Contract Documents or authorities having jurisdiction over the Project require certificates or statements of performance characteristics of materials, systems or equipment, or professional seals, calculations, or other certificates or statements regarding such Design/Build portions of the Project, Contractor shall provide them, and Owner and Architect will be entitled to rely on them to establish that the Design/Build portion(s) of the Project, including, but not limited to the designs, materials, systems, equipment, installation and performance of such work will meet the guidelines and performance criteria required by the Architect's and its consultants' Drawings and Specifications.

Article 4 - Administration of the Contract

4.1 Architect

4.1.1 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 Architect or Architect's authorized representative.

4.1.2 Duties, responsibilities and limitations of authority of Architect as set forth in *the Agreement between Owner and Architect and* the Contract Documents shall not be restricted or modified or extended without written consent of Owner \ and Architect. \ *Should there be inconsistencies between the descriptions of Architect's services in the Owner/Contractor Contract and the Owner/Architect Agreement, those in the Owner/Architect Agreement shall govern.. Architect will not perform services in connection with, and will have no responsibility for any portions of the Work or project for which documents are provided by others, whether or not such documents are bound together with the Architect's Drawings, Specifications and other documents.*

4.1.3 In case of termination of employment of Architect, Owner shall appoint an architect \ whose status under the Contract Documents shall be that of the former architect.

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4.2 Architect's Administration Of The Contract

4.2.1 \ Architect will advise and consult with Owner *and will assist Owner with administration of the Contract for Construction, as described in Owner-Architect Agreement.* Architect will have authority to act on behalf of Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.

4.2.2 Architect will visit the site at intervals \ *necessary in the judgment of Architect or as otherwise agreed by Owner and Architect in writing* to become generally familiar with the progress and quality of the *Work* completed and to determine in general if the Work \ completed *is* \ in accordance with the Contract Documents. However, Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of on-site observations as an architect, Architect will keep Owner informed of the progress and quality of the Work. \

4.2.3 Architect will not have control over or charge of and will not be responsible for *construction means*, methods, techniques, *schedules,* sequences or procedures, *fabrication, procurement, shipment, delivery, receipt or installation* or for safety precautions and programs in connection with the Work, since these are solely Contractor's responsibility as provided in Paragraph 3.3 *or elsewhere in the Contract Documents*. Architect will not be responsible for Contractor's, *Subcontractors', suppliers' or any other person's or entity's schedules or* failure to carry out the Work in accordance with the Contract Documents. Architect will not have control over or charge of \ acts or omissions of Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing or *supplying* portions of the Work. *Architect's duties shall not extend to the receipt, inspection and acceptance on behalf of Owner or Contractor of materials, furniture, furnishings and equipment at the time of their delivery to the premises or installation. Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of Architect in Architect's administration of the Contract for Construction, or by tests, inspections or approvals required or performed by persons other than Contractor. If Architect recommends procedures, either directly or by reference to standards or manufacturers' recommendations, Contractor shall adopt such recommendations as its own, or inform Architect if exception is taken to such procedures, and may utilize or propose alternative procedures that Contractor will warrant as fulfilling the intent of the Contract Documents.*

4.2.4 Communications Facilitating Contract Administration.
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, Owner and Contractor shall \ communicate through Architect. Communications by and with

Architect's consultants shall be through Architect. Communications by and with Subcontractors and material suppliers shall be through Contractor. \ *Should any direct communication become necessary, copies of the communication shall be promptly forwarded to the proper party or parties as set forth in this Subparagraph.*

4.2.5 Based on Architect's observations, and \ Contractor's Applications for Payment, Architect will review and *make recommendations to Owner regarding* the amounts due Contractor \ *on Architect's* Certificates for Payment *forms.* \

4.2.6 Architect will have authority to *recommend to Owner that Owner* reject Work which does not conform to the Contract Documents. Whenever Architect considers it necessary or advisable for implementation of the intent of the Contract Documents, Architect will have authority to *recommend to Owner that Owner* require additional inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3 whether or not such Work is fabricated, installed or completed. However, neither this authority of Architect nor a decision \ either to exercise or not to exercise such authority shall give rise to a duty or responsibility of Architect to Contractor, Subcontractors, material and equipment suppliers, their agents or employees or other persons *or entities* performing *or supplying* portions of the Work.

4.2.7 Submittals. \ Architect will review and \ take \appropriate action upon \ *those* Shop Drawings, Product Data and Samples *required of the Contractor by the Contract Documents ("Submittals")*, but only for the limited purpose of checking for *general* conformance with \ the *visual and aesthetic* design concept *as* expressed in \ *Architect's Drawings and Specifications.* \ Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the \ *construction* of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review *in accordance with the approved Submittal Schedule. Architect's ability to schedule and perform timely Submittal reviews is dependent on Contractor providing Submittals in accordance with Contractor's approved Submittal Schedule. Architect's reviews and actions* \ *on* such Submittals *shall not constitute approvals and* \ *are* not conducted for the *following* purposes*,* \ all of which remain the responsibility of the Contractor, as required by the Contract Documents*: checking for deviations between the Shop Drawings and differing information or conditions in the Contract Documents and field conditions; checking for errors and omission;* determining*, substantiating or confirming* the accuracy and completeness of other details such as dimensions and quantities; substantiating instructions for installation or performance of equipment or systems, approving safety precautions, approving any construction means, methods, techniques, sequences*,* \ procedures or fabrications; *performing the Work in a safe and satisfactory manner and in conformance with all requirements of the Contract Documents; and coordinating the Work of the trades*. Architect's review *and action on a specific item* shall not constitute approval of an assembly of which \ *such* item is a component. ; or approval of *a color or finish sample (or of that item as delivered and installed) if it does not conform to the Contract Documents. Architect's approval of a color or finish sample for an item shall not constitute approval for that item as delivered and installed if it does not conform to the Contract Documents.* \ Architect's review \ *and action on such* submittals shall not relieve \ Contractor of \ *its* obligations under Paragraphs 3.3, 3.5 and 3.12.

4.2.8 Architect *may* prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.

4.2.9 Architect will conduct \ *field reviews of the Work as set forth in Paragraph 9.8* to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to Owner for Owner's review and records written warranties and related documents required by the Contract *Documents* and assembled by Contractor, and will issue a final Certificate for Payment *as set forth in Paragraph 9.10.* \ *The handling by Architect of warranties, maintenance manuals or similar documents shall not diminish or transfer to Architect any responsibilities or liabilities required by the Contract Documents of Contractor or other entities or persons performing or supplying the Work.*

4.2.10 If Owner and Architect agree, Architect will provide one or more Project representatives to assist in carrying out 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 Architect will \ *provide written or graphic interpretations* concerning \ *the* requirements of the Contract Documents \ with reasonable promptness *as necessary or upon request of Owner or Contractor*. \ *Architect will not be liable for interpretations rendered in good faith*.

4.2.12 *Architect's in*terpretations \ will be consistent with *Architect's* intent \ *as expressed in, or* reasonably inferable from the Contract Documents \ .

4.2.13 Architect's decisions on matters relating to aesthetic effect *or visual design effect* will be final if consistent with the intent expressed in *and reasonably inferable from* the Contract Documents *and Architect shall not be liable for interpretations so rendered.*

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 Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 Referral to Architect. Claims, including those alleging an error or omission by Architect, *may* be referred initially to Architect for action as provided in Paragraph 4.4. *If Architect agrees to hear such claims, Architect shall be entitled to additional Compensation for services to be rendered.* \

4.3.3 Time Limits on Claims. Claims by either party must be made 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 made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

4.3.4 Continuing Contract Performance. Pending final resolution of a Claim \ *or dispute* unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Contract and Owner shall continue to make payments in accordance with the Contract Documents.

4.3.5 Waiver of Claims. Final Payment. The making of final payment shall constitute a waiver of Claims by 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.

4.3.6 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, *and if Owner and Contractor cannot reach an agreement as to how to proceed*, 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. Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in 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 Architect *finds* 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, Architect shall so notify Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such *notice* must be made within 21 days after Architect has given notice of the decision. If Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment *may* be referred to Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.7 Claims for Additional Cost. If 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 Paragraph 10.3. If Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from Architect, (2) an order by Owner to stop the Work where Contractor was not at fault, (3) a written order for a minor change in the Work issued by Architect, (4) failure of payment by Owner, (5) termination of the Contract by Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with the procedure established herein.

4.3.8 Claims for Additional Time

4.3.8.1 If Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. 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. *Claim for delay may only be made if the delay adversely affects the critical path of Contractor's schedule and adversely affects a portion of the Work that must be completed as scheduled to avoid delay to the final completion of the Work as a whole*.

4.3.8.2 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 and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the *critical path of Contractor's schedule for construction*.

4.3.9 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, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, 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 first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. \

4.4 Resolution Of Claims And Disputes

4.4.1 Architect *may at Architect's sole discretion* review Claims and take one or more of the following preliminary actions within ten days of receipt of a Claim: (1) request additional supporting data from the claimant, (2) submit a schedule to the parties indicating when Architect expects to take action, (3) reject the Claim in whole or in part, stating reasons for rejection, (4) recommend approval of the Claim by the other party or (5) suggest a compromise. Architect may also, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim.

4.4.2 If a Claim has been resolved *and Architect was involved in the Resolution of Claim as set forth in Subparagraph 4.4.1,* Architect will prepare or obtain appropriate documentation.

4.4.3 If a Claim has not been resolved, the party making the Claim shall, within ten days after Architect's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by Architect, (2) modify the initial Claim or (3) notify Architect that the initial Claim stands.

4.4.4 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by Architect, Architect will notify the parties in writing that Architect's decision will be made within seven days. \ Upon expiration of such time period, Architect will render to the parties Architect's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, Architect may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

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4.5 Dispute Resolution. *Precedent to any other legal action, claims, disputes or other matters in question between the parties to this Agreement arising out of or relating to this Agreement or breach thereof shall be subject to good faith mediation under the auspices of a recognized, neutral third-party professional mediation service, or other mediation method acceptable to both parties. The cost of the mediation service shall be borne equally by the parties.*

4.5.1 Attorneys' Fees; Prevailing Party. *Should any proceeding be commenced between the parties to this Agreement seeking to enforce any of its provisions, the prevailing party in such proceeding shall be entitled, in addition to such other relief as may be granted, to a reasonable sum for attorneys' fees and all legal expenses and fees incurred through appeal, which shall be determined by the court or forum in such proceeding or in a separate action brought for that purpose. For the purpose of this provision, "prevailing party": shall include a party which dismisses an action for recovery hereunder in exchange for payment of the sum alleged due, performance of the covenants alleged breached, or consideration substantially equal to the relief sought in the action or proceeding.*

Article 5 - Subcontractors

5.1 Definitions

5.1.1 A Subcontractor is a person or entity who has a direct contract with Contractor to perform a portion of the Work. \ 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. \ 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, Contractor, \ *within five days* after award of the Contract, shall furnish in writing to Owner through 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. Architect will promptly reply to Contractor in writing stating whether or not Owner \ has reasonable objection to any such proposed person or entity. Failure of Owner or Architect to reply \ *in a timely manner* shall constitute notice of no reasonable objection. *Notwithstanding Owner's right to investigate the suitability of any listed Subcontractor or material supplier, Owner shall have no duty to do so.*

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

5.2.3 If Owner \ has reasonable objection to a person or entity proposed by Contractor, Contractor shall propose another to whom Owner \ has no reasonable objection. The Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued. However, no increase in the Contract Sum shall be allowed for such change unless Contractor has acted promptly and responsively in submitting names as required.

5.2.4 Contractor shall not change a Subcontractor, person or entity previously selected if Owner \ makes reasonable objection to such change.

5.3 Subcontractual Relations

5.3.1 By appropriate agreement, written where legally required for validity, Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to Contractor by terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor, by these Documents, assumes toward Owner and Architect. Each subcontract agreement shall preserve and protect the rights of 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 Contractor that Contractor, by the Contract Documents, has against Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. 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 shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.3.2 *Contractor shall require each Subcontractor to waive any right the Subcontractor may have against Owner for damage caused by fire or other perils which may be covered by property insurance available to Subcontractor.*

5.4 Contingent Assignment Of Subcontracts

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

.1 assignment is effective only after termination of the Contract by Owner \ and only for those subcontract agreements which Owner accepts by notifying the Subcontractor in writing; and

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

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Article 6 - Construction by Owner or by Separate Contractors

6.1 Owner's Right To Perform Construction And To Award Separate Contracts

6.1.1 Owner reserves the right to perform construction or operations related to Project with Owner's own forces, and to award separate contracts in connection with other portions of Project or other construction or operations on the site \ . If Contractor claims that delay or additional cost is involved because of such action by Owner, Contractor shall make such Claim as provided elsewhere in the Contract Documents.

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

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

6.1.4 Unless otherwise provided in the Contract Documents, when Owner performs construction or operations related to Project with Owner's own forces, Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to Contractor under the Conditions of the Contract \ .

6.2 Mutual Responsibility

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

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

6.2.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefor.

6.2.4 Contractor shall promptly remedy damage \ caused by Contractor to completed or partially completed construction or to property of Owner or separate contractors \ .

6.2.5 Claims and other disputes and matters in question between Contractor and a separate contractor shall be subject to the provisions of Paragraph 4.3 provided the separate contractor has reciprocal obligations.

6.2.6 Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for Contractor in Paragraph 3.14.

6.3 Owner's Right To Clean Up. If a dispute arises among Contractor, separate contractors and Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Paragraph 3.15, Owner may clean up and allocate the cost among those responsible \ .

Article 7 - Changes in the Work

7.1 Changes

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 \ *between* Owner *and* Contractor \ ; a Construction Change Directive \ *may be issued* by Owner *or* Architect and may or may not be agreed to by Contractor; an order for a minor change in the Work may be issued by Architect alone.

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

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

7.2 Change Orders

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

.1 a change in the Work;

.2 the amount of the adjustment in the Contract Sum, if any; and

.3 the extent of the adjustment in the Contract Time, if any.

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

7.3 Construction Change Directives

7.3.1 A Construction Change Directive is a written order prepared by Architect and signed by Owner**,** \ directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. 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 Subparagraph 7.3.6.

7.3.4 Upon receipt of a Construction Change Directive, Contractor shall promptly proceed with the change in the Work involved and advise Architect of 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 Contractor indicates the agreement of 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 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 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 Clause 7.3.3.3, Contractor shall keep and present, in such form as Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Subparagraph 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' or workmen's 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 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 Pending final determination of cost to Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by Contractor to Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by 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.

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7.4 Minor Changes In The Work. 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 Owner and Contractor. Contractor shall carry out such written orders promptly.

7.5 Change Order Requests

7.5.1 *Owner may propose Changes in the Work by issuing supplementary instructions to Contractor describing the Change and requesting from Contractor the submission of a Change Order Request. Where time does not permit the processing of a Change Order prior to commencing the Work, Contractor shall, upon written order from Owner, proceed with the Work while concurrently proceeding with preparation and submission of a Change Order Request.*

7.5.2 *Within five days of receipt of supplemental instructions or a written order to proceed with a Change in the Work Contractor shall provide to Owner and Architect a preliminary estimate of any change in Contract Sum or Contract Time for such Change in the Work. In no more than fifteen days thereafter, Contractor shall submit a Change Order Request to Owner and Architect indicating the requested adjustment in Contract Sum and Contract Time, if any, justified with an itemization of all costs of labor, materials, supplies, equipment and reasonable overhead and profit. Any request for an extension of time shall be justified by reference to the then current construction schedule. If no Change Order Request is submitted by Contractor within twenty days of initial Owner request for same, it shall be conclusively presumed that the Change proposed in the supplementary instructions to Contractor will not result in an increase in the Contract Sum or in the Contract Time and that Contractor will perform the Work without any such increase. If Contractor is unable to submit the above information within the specified time limit it shall notify Owner and Architect in writing, setting forth for Owner's approval a date by which it will submit the information as well as a schedule for the performance of the Change in the Work.*

7.5.3 *Upon Owner's acceptance of a Change Order Request, Architect shall prepare a Change Order for execution by Owner and Contractor adjusting the Contract Sum and Contract Time.*

7.5.4 *In the event that Owner and Contractor do not agree on an adjustment in Contract Sum or Contract Time, Owner may nevertheless issue a Directive ordering that the change proceed pending such an agreement, and that the adjustment in Contract Sum shall be based on an accounting of reasonable expenditures or savings on labor, materials and equipment as well as reasonable overhead and profit, and Contractor shall promptly proceed with the Changes in the Work.*

7.5.5 *No Change in the Work shall be the basis of an addition to the Contract Sum or a change in the Contract Time unless such Change has been authorized by a Change Order executed in accordance with the Contract Documents. Changes in the Work may be made without notice to Contractor's sureties and absence of such notice shall not relieve such sureties of any of their obligations to Owner.*

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. The date shall not be postponed by the failure to act of Contractor or of persons or entities for whom Contractor is responsible.

8.1.3 The date of Substantial Completion \ *shall be as defined in* Paragraph 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 Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2 Contractor shall not knowingly, except by agreement or instruction of Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11, *the Bidding Requirements and the Contract Documents,* to be furnished by Contractor. 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 a notice to proceed given by Owner, Contractor shall notify 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 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 Contractor is delayed at any time in progress of the Work by an act or neglect of Owner or Architect, or of an employee of either, or of a separate contractor employed by Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond Contractor's control, or by delay authorized by Owner \ then the Contract Time shall be extended by Change Order for such reasonable time as \ may *be* determined*. A time extension shall be Contractor's sole remedy and there shall be no compensation for any such delays other than those resulting from the active interference of Architect, Owner or their employees or agents*.

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

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

Article 9 - Payments and Completion

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

9.2 Schedule Of Values. *If a Schedule of Values is not appended to Owner Contractor Agreement, then* before the first Application for Payment, Contractor shall submit to Architect *and Owner* 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 Architect may require. This schedule, unless objected to by Architect *or Owner*, shall be used as a basis for reviewing 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, Contractor shall submit to Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, \ and supported by such data substantiating Contractor's right to payment as Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, *lien waivers and releases*, and reflecting retainage \ provided for elsewhere in the Contract Documents.

9.3.1.1 Such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

9.3.1.2 Such applications may not include requests for payment of amounts Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

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 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 Contractor with procedures satisfactory to Owner to establish Owner's title to such materials and equipment or otherwise protect Owner's interest, and shall include applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

9.3.3 Contractor warrants that title to all Work covered by an Application for Payment will pass to Owner no later than the time of payment. 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 Owner shall, \ be free and clear of liens, claims, security interests or encumbrances in favor of 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 Architect will, within seven days after receipt of Contractor's Application for Payment, either issue to Owner a Certificate for Payment, with a copy to Contractor, for such amount as Architect *recommends* is properly due, or notify Contractor and Owner in writing of Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of *Architect's* Certificate for Payment will constitute a representation \ to Owner, based on Architect's observations at the site *as provided in Subparagraph 4.2.2* and the data comprising *Contractor's* Application for Payment, that the Work has progressed to the point indicated and that, to the best of Architect's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to \ *a review* of the Work for *general* conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by Architect. \ However, the issuance of a Certificate for Payment will not be a representation that the Work is without defects or that 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, schedules, sequences or procedures *or other items set forth in Subparagraph 4.2.3,* (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by Owner to substantiate Contractor's right to payment or (4) ascertained how or for what purpose Contractor has used money previously paid on account of the Contract Sum. *Further, Architect shall not be obligated to issue any Certificate for Payment covering work by Design/Build contractors or subcontractors, work by Owner's separate contractors, or other work for which Architect is not providing full services.*

9.5 Decisions To Withhold Certification

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

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims;

.3 failure of Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to Owner or another contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

.7 \ failure to carry out the Work in accordance with the Contract Documents; *or*

.8 *rejection or non-acceptance of any Work by any governmental agency having jurisdiction.*

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 Architect has issued a Certificate for Payment, Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify Architect. *Payments may be made by check jointly payable to Contractor, its Subcontractor or supplier and any applicable labor union trust fund.*

9.6.2 Contractor shall promptly pay each Subcontractor, upon receipt of payment from Owner, out of the amount paid to 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 Contractor on account of such Subcontractor's portion of the Work. Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in similar manner.

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

9.6.4 Neither 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 Subparagraphs 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 Project by Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.7 Failure Of Payment. If Architect does not issue a Certificate for Payment, through no fault of Contractor, within seven days after receipt of Contractor's Application for Payment, or if Owner does not pay Contractor within seven days after the date established in the Contract Documents the amount certified by Architect or awarded by \ *a court or forum of competent jurisdiction*, then Contractor may, upon seven additional days' written notice to Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of Contractor's reasonable costs of shut-down, delay and startup, which shall be accomplished as provided in Article 7.

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 *and all required final inspections and permits, including the certificate of occupancy, if required, have been obtained* so Owner can occupy or utilize the Work for its intended use*, subject only to completion of minor items ("punch list").*

9.8.2 When Contractor considers that the Work, or a portion thereof which Owner agrees to accept separately, is substantially complete, Contractor shall prepare and submit to Architect a comprehensive list *(punch list)* of items to be completed or corrected. Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of Contractor's list, Architect will make *a field review* to determine whether the Work or designated portion thereof is substantially complete. If Architect's *field review* discloses any item, whether or not included on Contractor's list, which is not in accordance with the requirements of the Contract Documents, Contractor shall, before *Architect \ issues* the Certificate of Substantial Completion, complete or correct such item upon notification by Architect. Contractor shall then submit a request for another *field review* by Architect to determine Substantial Completion. *If upon this subsequent review, Contractor has not yet completed the Work, and further field reviews by Architect are required, Contractor shall be responsible to Owner for any additional cost to Owner of further reviews by Architect.* When the Work or designated portion thereof is substantially complete, Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which 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. The Certificate of Substantial Completion shall be submitted to Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. *In the absence of such certificate, the date of Substantial Completion shall be in accordance with Subparagraph 9.8.1.*

9.8.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by Contractor and *issuance of a certificate* by Architect, Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

9.9 Partial Occupancy Or Use

9.9.1 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 Contractor, provided such occupancy or use is consented to by the insurer as required under Subparagraph 11.3.11 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 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 Contractor considers a portion substantially complete, Contractor shall prepare and submit a list to Architect as provided under Subparagraph 9.8.2. Consent of 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 Owner and Contractor \ .

9.9.2 Immediately prior to such partial occupancy or use, 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, *nor shall it start the guarantee or warranty period.*

9.10 Final Completion And Final Payment

9.10.1 Upon receipt of written notice that the Work is ready for *final field review* and acceptance and upon receipt of a final Application for Payment, Architect will promptly make such *field review* and, when Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, Architect will promptly issue a final Certificate for Payment stating that to the best of Architect's knowledge, information and belief, and on the basis of Architect's observations and *field reviews*, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due Contractor and noted in said final Certificate is due and payable. \

9.10.2 Neither final payment nor any remaining retained percentage shall become due until Contractor submits to Architect *and Owner* (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which Owner or 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 Owner, (3) a written statement that 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 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 Owner. If a Subcontractor refuses to furnish a release or waiver required by Owner, Contractor may furnish a bond satisfactory to Owner to indemnify Owner against such lien. If such lien remains unsatisfied after payments are made, Contractor shall refund to Owner all money that 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 Contractor or by issuance of Change Orders affecting final completion, \ Owner shall, upon application by Contractor and certification by 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 Contractor to 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. The making of final payment shall constitute a waiver of claims by Owner as provided in Subparagraph *4.3.5. Notwithstanding the foregoing, in no event shall the retainage attributable to any unfinished Work be less than 150% of the cost to complete the Work as estimated by Architect.*

9.10.4 Acceptance of final payment by 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. Such waivers shall be in addition to the waiver described in Subparagraph 4.3.5.

Article 10 - Protection of Persons and Property

10.1 Safety Precautions And Programs

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

10.1.2 *Unless the Agreement specifically provides otherwise,* in the event Contractor *at any time* encounters on the site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), *lead-based paints or any other potentially toxic or hazardous contaminants, materials, pollutants which for the purpose of this Article 10 means solid, liquid, gaseous, or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals and wastes ("Hazardous Substance"),* \ :

.1 *If the Hazardous Substance is not incident to Work on the site,* Contractor shall immediately stop Work in the area affected and report the condition to Owner in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of Owner and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) *or other Hazardous Substance* and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of \ *Hazardous Substance,* or when it has been rendered harmless. \

.2 *If the Hazardous Substance is introduced incident to the Work, Contractor shall immediately notify Owner in writing and reach an understanding with Owner as to how Contractor will, at its expense, take action as required to contain and remove or render harmless the Hazardous Substance. Contractor shall promptly report the progress and all actions taken to Owner in writing.*

10.1.3 *Prior to commencement of the Work, Contractor shall require manufacturers of all materials and equipment for the Work to provide certifications, warranties or statements that such materials or equipment (1) are free of injurious amounts of Hazardous Substances or (2) contains specific amounts of Hazardous Substances and recommendations regarding handling of such. Such certifications, warranties or statements shall be in writing in a form acceptable to Owner, and shall be forwarded by Contractor to Owner. If the manufacturer states that a material or equipment contains injurious amounts of Hazardous Substances, Owner shall be afforded adequate and timely opportunity to order that other materials be substituted without causing delay to Project.*

Contractor agrees to indemnify, defend and hold Owner, Architect, their officers, directors, shareholders, employees, agents, and consultants (for the purpose of this Subparagraph 10.1.3, individually and collectively "Indemnitee(s)" respectively) harmless from and against any and all claims, liabilities, suits, demands, losses, damages, costs and expenses, including, but not limited to, reasonable attorneys' fees and all legal expenses and fees incurred through appeal, and all interest thereon, accruing to or resulting from any and all persons, firms or any other legal entities on account of any damages or losses to property or persons, , but not limited to, injuries or death or economic losses arising out of portions of the Work which contain, utilize, generate, or emit injurious amounts of Hazardous Substances or Hazardous Substances not rendered harmless, whenever occurring, except that Contractor shall have no duty to indemnify an Indemnitee that is found to be solely liable as between the parties hereto as well as between any other persons, firms or any other legal entities for such damages or losses by a court or forum of competent jurisdiction.

10.1.4 \ Owner shall indemnify *defend* and hold \ Contractor, Architect, \, *their officers, directors, shareholders, employees, agents, and consultants* \ *(for the purpose of this Subparagraph 10.1.4, individually and collectively "Indemnitee(s)" respectively) harmless* from and against *any and all* claims, \ *liabilities, suits, demands*, losses, damages, *costs* and expenses, including but not limited to, *reasonable* attorneys' fees, *and all legal expenses and fees incurred through appeal, and all interest thereon, accruing to or resulting from any and all persons, firms or any other legal entities on account of any damages or losses to property or persons, including, but not limited to, injuries or death or economic losses* arising out of \ performance of the Work in the affected area if in fact \ *there exists* asbestos, *lead-based paint* or polychlorinated biphenyl (PCB) *or other Hazardous Substances* \ *that have* not been rendered harmless, *except where the Indemnitee is found to be solely liable as between the parties hereto as well as between any other persons, firms or any other legal entities for such damages or losses by a court or forum of competent jurisdiction.* 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 Subparagraph 10.1.4.

10.2 Safety Of Persons And Property

10.2.1 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 Contractor or Contractor's Subcontractors or Sub-subcontractors;

.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; *and*

.4 *the completed Work within or adjacent to existing facilities including furnishings, equipment and personal property.*

10.2.2 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 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 Substances or equipment or unusual methods are necessary for execution of the Work, Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

10.2.5 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 Clauses 10.2.1.2, 10.2.1.3 *and 10.2.1.4* caused in whole or in part by 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 Contractor is responsible, \ except damage or loss attributable to acts or omissions of 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 Contractor. The foregoing obligations of Contractor are in addition to Contractor's obligations under Paragraph 3.18.

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

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

10.3 Emergencies

10.3.1 In an emergency affecting safety of persons or property, Contractor shall act, at Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by Contractor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7.

Article 11 - Insurance and Bonds

11.1 Contractor's Liability Insurance

11.1.1 *Unless otherwise provided for in the Bidding Requirements or Contract Documents or otherwise agreed to in writing by Owner and Contractor,* Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which Project is located such insurance as will protect Contractor from claims set forth below which may arise out of or result from Contractor's operations under the Contract and for which Contractor may be legally liable, whether such operations be by 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. *Such policies, except worker's compensation, shall be endorsed to name Owner and Architect as additional insureds.*

.1 claims under workers' or workmen's 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 Contractor's employees;

.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by Contractor, or (2) by another person;

.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; and

.7 claims involving contractual liability insurance applicable to Contractor's obligations under Paragraph 3.18.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the *Bidding Requirements*, 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 *Copies of policies or* Certificates of Insurance acceptable to Owner shall be filed with Owner prior to commencement of the Work. These Certificates and the insurance policies required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be *modified,* canceled or allowed to expire until at least 30 days' prior written notice has been given to 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 Subparagraph 9.10.2. Information concerning reduction of coverage shall be furnished by Contractor with reasonable promptness. \

11.1.4 *If Contractor fails to secure and maintain the required insurance, Owner shall have the right (but not the obligation) to secure same in the name and for the account of Contractor, in which event Contractor shall pay the cost thereof and shall furnish upon demand all information that may be required in connection therewith.*

11.2 Owner's Liability Insurance. Owner shall be responsible for purchasing and maintaining Owner's usual liability insurance. Optionally, Owner may purchase and maintain other insurance for self protection against claims which may arise from operations under the Contract. Contractor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the *Bidding Requirements or* Contract Documents.

11.3 Property Insurance

11.3.1 Unless otherwise \ *required in the Bidding Requirements, or in Owner/Contractor Agreement, Supplementary Conditions, or Special Conditions,* Owner shall purchase and maintain, in a company or companies

lawfully authorized to do business in the jurisdiction in which Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary 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 Paragraph 9.10 or until no person or entity other than Owner has an insurable interest in the property required by this Paragraph 11.3 to be covered, whichever is earlier. This insurance shall include interests of Owner, Contractor, Subcontractors and Sub-subcontractors in the Work.

11.3.1.1 Property insurance shall be on an all-risk policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's services and expenses required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise provided in the Contract Documents *or Bidding Requirements. Such policies shall be endorsed to name Owner and Architect as additional insureds.*

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

11.3.1.3 If the property insurance requires minimum deductibles and such deductibles are identified in the *Bidding Requirements* or Contract Documents, Contractor shall pay costs not covered because of such deductibles. If Owner or insurer increases the required minimum deductibles above the amounts so identified or if Owner elects to purchase this insurance with voluntary deductible amounts, Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles. If deductibles are not identified in the Contract Documents, Owner shall pay costs not covered because of deductibles.

11.3.1.4 Unless otherwise provided in the *Bidding Requirements* or Contract Documents, this property insurance shall cover portions of the Work stored off the site after written approval of Owner at the value established in the approval, and also portions of the Work in transit. *It shall not, however, cover Contractor's equipment, machinery or tools.*

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

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

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

11.3.5 If during Project construction period Owner insures properties, real or personal or both, adjoining or adjacent to the site by property insurance under policies separate from those insuring 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 Project during the construction period, *if permitted by insurer, and to the extent covered for any losses*, Owner shall waive all rights in accordance with the terms of Subparagraph 11.3.7 for damages caused by fire or other perils covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

11.3.6 Before an exposure to loss may occur, Owner shall file with Contractor a *certificate of insurance or* copy of each policy that includes insurance coverages required by this Paragraph 11.3. Each policy *or certificate* 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 until at least 30 days' prior written notice has been given to Contractor.

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

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

11.3.9 If required in writing by a party in interest, Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. Owner shall deposit in a separate account proceeds so received, which Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with \ *a legal judgment or* award \ . If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order *or Change Directive*.

11.3.10 Owner as fiduciary shall have power to adjust and settle a loss with insurers \ .

11.3.11 Partial occupancy or use in accordance with Paragraph 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. Owner and 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 Performance Bond And Payment Bond

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

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising

under the Contract, 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 Architect's request or to requirements specifically expressed in the Contract Documents, *or to requirements of any public authority having jurisdiction over the Work*, it must, if required in writing by Architect *or Owner*, be uncovered for Architect's *or Owner's or public authority's* observation and be replaced at Contractor's expense *and* without change in the Contract Time.

12.1.2 If a portion of the Work has been covered which Architect *or its Consultants have* not specifically requested to observe prior to its being covered, *or which any public authority requires being* observed or inspected prior to covering, Architect *or Owner* may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to Owner. If such Work is not in accordance with the Contract Documents, Contractor shall pay such costs unless the condition was caused by Owner or a separate contractor in which event Owner shall be responsible for payment of such costs.

12.2 Correction Of Work

12.2.1 Contractor shall promptly correct *defective* Work \ or *Work* failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. Contractor shall bear costs of correcting such \ Work, including additional testing and inspections and compensation for Architect's services and expenses made necessary thereby.

12.2.2 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 Subparagraph 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, Contractor shall correct it promptly after receipt of written notice from Owner to do so unless Owner has previously given Contractor a written acceptance of such condition. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation under this Subparagraph 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract. Owner shall give such notice promptly after discovery of the condition.

12.2.3 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 Contractor nor accepted by Owner.

12.2.4 If Contractor fails to *proceed with the correction of* nonconforming Work within \ *seven days of notice by Owner or Architect, and thereafter fails to diligently continue such correction until completed,* Owner may correct it in accordance with Paragraph 2.4. If Contractor does not proceed with correction of such nonconforming Work within \ *the time period set forth herein*, Owner may remove it and store the salvable materials or equipment at Contractor's expense. If Contractor does not pay costs of such removal and storage within ten days after written notice, Owner may upon ten additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by Contractor, including compensation for Architect's *and Owner's* services and expenses made necessary thereby. If such proceeds of sale do not cover costs which Contractor should have borne, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to Owner.

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

12.2.6 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which Contractor might have under the Contract Documents. Establishment of the time period of one year as described in Subparagraph 12.2.2 relates only to the specific obligation of 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 Contractor's liability with respect to Contractor's obligations other than specifically to correct the Work.

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

Article 13 - Miscellaneous Provisions

13.1 Governing Law. The Contract shall be governed by the law of the place where Project is located.

13.2 Successors And Assigns. Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party 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. *Notwithstanding the above, Owner may assign its rights and obligations hereunder to its lender, if any, and Contractor agrees, if requested, to enter into agreement with such lender pursuant to which Contractor will complete the Work in accordance with Owner Contractor Agreement and any agreed-upon modification or changes thereto.*

13.3 Written Notice. 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 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, Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Contractor shall give Architect *and all other appropriate persons or agencies* timely notice of when and where tests and inspections are to be made so \ *they* may observe such procedures. Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded. *Contractor shall pay for all retesting required under applicable laws and regulations.*

13.5.2 If Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.1, Architect will, upon written authorization from Owner, instruct Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to Owner, and Contractor shall give timely notice to Architect *and other appropriate persons or agencies* of when and where tests and inspections are to be made so \ *they* may observe such procedures. Owner shall bear such costs except as provided in Subparagraph 13.5.3.

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

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

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

13.5.6 Tests or inspections \ shall be made promptly to avoid unreasonable delay in the Work.

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

13.7 Commencement Of Statutory Limitation Period

13.7.1 As between 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 Contractor pursuant to any warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by Contractor under Paragraph 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by Contractor or Owner, whichever occurs last.

Article 14 - Termination or Suspension of the Contract

14.1 Termination By Contractor

14.1.1 Contractor may terminate the Contract if the Work is stopped for a period of 30 days *after actual commencement of construction* through no act or fault of Contractor or a Subcontractor, Sub- subcontractor or their agents or employees or any other persons performing portions of the Work under contract with Contractor, for any of the following reasons:

.1 issuance of an order of a court or other public authority having jurisdiction;

.2 an act of government, such as a declaration of national emergency, making material unavailable;

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

.4 if repeated suspensions, delays or interruptions by Owner as described in Paragraph 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**.**

\

14.1.2 If one of the above reasons exists, Contractor may, upon seven additional days' written notice to Owner and Architect, terminate the Contract and recover from Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead *and* profit \ .

14.1.3 If the Work is stopped for a period of 60 days through no act or fault of Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with Contractor because Owner has persistently failed to fulfill Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, Contractor may, upon seven additional days' written notice to Owner and Architect, terminate the Contract and recover from Owner as provided in Subparagraph 14.1.2.

14.2 Termination By Owner For Cause

14.2.1 Owner may terminate the Contract if Contractor:

.1 *unreasonably* \ 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 Contractor and the Subcontractors;

.3 \ 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, Owner, \ without prejudice to any other rights or remedies of Owner and after giving Contractor and Contractor's surety, if any, seven days' written notice, *may* terminate employment of 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 Contractor;

.2 accept assignment of subcontracts pursuant to Paragraph 5.4; and

.3 finish the Work by whatever reasonable method Owner may deem expedient.

14.2.3 When Owner terminates the Contract for one of the reasons stated in Subparagraph 14.2.1, 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 *all* costs *to Owner* of finishing the Work, including, *without limitation,* compensation for Architect's services and expenses made necessary thereby, *other consultants, and attorneys and other legal costs,* such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner \ . This obligation for payment shall survive termination of the Contract.

14.3 Suspension By Owner For Convenience

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

14.3.2 An adjustment shall be made for *any reasonable* increases in the cost *to Contractor* of performance of the Contract, including *a reasonable* profit on the increased cost of performance, \ *resulting from* suspension, delay or interruption in excess of thirty days. *Such increase in Contractor's profit or fee shall be calculated by multiplying the profit or fee which Contractor would otherwise earn upon completion of the Work by a fraction, the numerator of which is the increased cost of performance and the denominator of which is the Contract Sum prior to such* suspension, delay or interruption. 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 Contractor is responsible; or

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

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14.4 Termination By Owner For Convenience

14.4.1 *Owner may at any time, without notice to the sureties, terminate the employment of Contractor for the convenience of Owner, for any reason and without respect to whether Contractor is then in default under the Contract Documents. In the event of such termination for convenience, and notwithstanding any other provision of the Contract Documents to the contrary, Contractor shall receive, as its entire and sole compensation under this Agreement, its actual, necessary and reasonable Cost of the Work through the date of termination, as determined by audit of Contractor's records, plus a reasonable profit or fee calculated by multiplying the profit or fee which Contractor would have otherwise earned upon completing the Work by a fraction, the numerator of which is the Cost of the Work performed through the date of termination and the denominator of which is the Contract Sum, together with reasonable actual costs of termination. Provided, however, that such fee or profit shall not exceed the fee or profit Contractor would have earned had Contractor completed the Work. Upon such termination, Contractor shall assign to Owner and Owner shall assume responsibility for obligations accruing after the date of such assignment under agreements with Subcontractors and Suppliers entered into by Contractor in order to perform the Work. Contractor shall make its records available at reasonable time and places for Owner's audit. In the event any termination of Contractor for default under the Contract is later determined to have been improper, the termination shall be automatically converted to a termination for convenience and the Contract shall be limited in its recovery strictly to the compensation provided for above.*

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 MINOR CHANGES IN THE WORK

A. Architect may issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form included at end of Part 3.

1.3 PROPOSAL REQUESTS

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

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within 5 days unless otherwise provided in the General Conditions after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    b. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

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

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
3. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times,

and activity relationship. Use available total float before requesting an extension of the Contract Time.

4. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use Gensler "Bulletin," selecting, Architect's Request for Contractor's Proposal."

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on Gensler "Change Order" form included at end of Part 3.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

Bulletin Number

Gensler

Project | **Date**

Project Location | **Architect's Project Number**

Owner/Client | **File** 6BL | **This is page** 1 of

To | **Attention**

Address

City | **State** | **Zip Code**

Delivered via: ☐ **Messenger** ☐ **Hand carried** ☐ **Facsimile** ☐ **Express** ☐ **Pick-up** ☐ **E-mail Address** ☐ **Mail** ☐ **UPS** ☐ **Website Address**

This Bulletin Conveys to Contractor (Check one of the following five choices.):

☐ **Architect's Authorization for Minor Changes**
Architect recommends modifications to the Work as described below.

☐ **Architect's Clarification / Supplemental Instructions** (Use this Bulletin form in place of *Architect's Supplemental Instructions* form.)
Contractor shall carry out the Work in accordance with the following supplemental instructions.

☐ **Architect's Confirmation of a Field Order** (Use this Bulletin form in place of a *Field Order* form.)
This confirms Architect's verbal instructions to (individual's name) _____ on (date) _____, as described below.

Note: The above three choices are each subject to the following terms: The change(s), clarification(s) and/or confirmation(s) described below is/are issued in accordance with the Contract Documents, without change in Contract Sum and/or Time.

☐ **Architect's Request for Contractor's Proposal** (Use this Bulletin form in place of an *Estimate Request* form.)
Please submit an itemized proposal for changes in the Contract Sum and/or Time for proposed modifications to the Contract Documents described herein.

Submit proposal **within** _____ **days** or notify the Architect in writing ofthe date on which you anticipate submitting your proposal. This is not a Change Order or a Construction Change Directive or a direction to proceed with the Work described in the proposed modifications.

☐ **Other:** As described below.

Attachments

Requested by

☐ Architect ☐ Owner ☐ Contractor ☐ Other (specify):

Issued by Gensler by | **Date Signed**

Issued by Owner by | **Date Signed**

☐ Required; Please return signed copy to Gensler ☐ Not Required

Accepted by Contractor by | **Date Signed**

☐ Required; Please return signed copy to Gensler ☐ Not Required

Distribution

Prepared by Gensler by | **Date Signed**

Instructions / Description / References / Dates

Begin text here . . .

Change Order Number

Gensler

Project	**Date**
Project Location	**Project Number**
Owner/Client	**File** 6CO **This is page** 1 of
Contractor	**Contractor's Request / Quotation Number / Date**
Change to Contract Sum: $	**Change to Contract Time:**
Original Contract Amount: $	**Revised Contract Amount:** $

☐ **See Change Order Summary for Revised Total Contract Amount and Time**

Reason for Change	**Requested by**

Recommended for Approval by Gensler: by	**By**	**Date Signed**
Approved for Owner/Client	**By**	**Date Signed**
Approved for Contractor	**By**	**Date Signed**
Approved for Tenant (if applicable)	**By**	**Date Signed**

The above Change Order to the contract shall be effective upon signature by all applicable parties, in accordance with the Conditions of the Contract. The Contract Amount refers to the Contract Sum or guaranteed Maximum Cost in the Contract.

Distribution

Description / References / Costs / Dates

Begin text here . . .

SECTION 01 26 13 – REQUESTS FOR INTERPRETATION (RFI'S)

PART 1 - GENERAL

1.1 REQUEST(S) FOR INTERPRETATION (RFI'S)

A. General: A Request for Interpretation (RFI) is a Contractor initiated, Architect formatted, written instrument related to the execution of the Work that is addressed to the Architect. The RFI shall be used by the Contractor as the means to ask questions related to the Work; subject to the conditions contained within this article.

1. An RFI which fails to conform to the requirements stated herein, (for example, is incomplete or contains numerous errors) shall be returned to the Contractor for its completion/rectification without benefit of the Architect's response, in addition, no adjustments for Contract Time or Contract Sum shall be granted for an RFI failing to conform to the requirements stated herein.
2. The Owner reserves the right to assess the Contractor for the cost (based on time and materials) of an RFI response performed by the Architect, and any of it's consultants, which is deemed by the Owner and the Architect as being frivolous or unnecessary (for example, the subject of the RFI is addressed in the Contract Documents). Such RFI's shall be removed from the RFI log.
3. Each RFI shall be submitted with such promptness as to cause no delay in the Contractor's own work and in that of any subcontractor. No adjustments of Contract Time or Contract Sum will be granted because of failure to have an RFI submitted with sufficient time to allow for the orderly processing of a response by the Architect.

B. Authorship:

1. Prior to the commencement of the RFI process, the Contractor shall designate a full time "RFI Manager" whose duties shall include the responsibility for enforcing the Request for Interpretation provisions of this article, to maintain an up-to-date log of all RFI's, advise the Architect, in writing, of the status and disposition of all RFI's at the progress meetings, and be a member of the Contractor's staff. The RFI Manager shall be experienced in administration and supervision of building construction of the type indicated on the contract documents including mechanical and electrical work.
2. Each RFI shall originate solely from the Contractor's RFI Manager. An RFI submitted to the Architect by an entity, or individual, other than the RFI Manager shall be returned to the Contractor.

C. Prohibitions: RFI's shall not be used for the following:

1. To solicit consideration by the Architect of a "substitution."
2. To request an adjustment of the Contract time. If the Contractor believes that the response received from the Architect to any RFI warrants adjustment to the Contract time it shall immediately advise the Architect, in writing, upon receipt of the Architect's response.
3. To request an adjustment of the Contract sum. If the Contractor believes that the response received from the Architect to any RFI warrants adjustment of the Contract sum

it shall immediately advise the Architect, in writing, upon receipt of the Architect's response.

4. To solicit comment clarification(s) of any required submittal or shop drawing review that was transmitted by the Architect to the Contractor.
5. RFI's shall not be used to transfer coordination responsibility from the Contractor to the Owner or the Architect.

D. Procedure:

1. The Contractor shall submit all RFI's on the form supplied by the Architect.
2. Each blank on the RFI form shall be filled in.
3. Each RFI shall be typewritten and shall be forwarded to the Architect in triplicate. Each RFI shall address one subject.
4. Each RFI shall contain specific reference to the drawing number(s), detail number(s), schedule type(s), bulletin number(s), specification section(s) and paragraph number(s), or other related document(s) which is (are) pertinent to the Contractor's question. The date of each referenced drawing number, bulletin, specification section or other related document shall be identified. In preparing each RFI verify the applicable dimension(s), field conditions, drawing requirements (small through large scale details), and/or specification section requirements pertaining thereto. Prior to submission of the RFI coordinate the nature of the inquiry with the requirements of other sections or trades as related thereto and responses to previous RFI's. Where supplementary sketches are required to clarify an inquiry the Contractor shall attach supplementary sketches, at large scale, illustrative of the inquiry. Sketches shall include sufficient detail, materials, dimensions, thicknesses, assembly, attachments, relation to adjoining work, structural grid references, and all other pertinent data and information for the Architect to make an informed response.

    a. The Contractor is encouraged to suggest solution(s) to its inquiries, if applicable. Should the Contractor's solution(s) have an impact on Contract Sum or Contract time it shall be so stated within the RFI.

5. Each RFI shall be dated and sequentially numbered.
6. Each RFI shall be reviewed, and signed, by the RFI Manager prior to transmitting to the Architect.
7. Duration of RFI Response Upon Receipt: 5 business days.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 13

REQUEST FOR INTERPRETATION

DATE: _____ RFI No.: _____

TO: Gensler
711 Louisiana, Suite 300
Houston, Texas 77002

RE: _____ Project No.: _____
(Project Name) (Gensler Project Number)

FROM: _____ Project No.: _____
(Contractor) (Contractor Project Number)

_____ Subcontractor: _____
(Address)

_____ Subcontractor RFI No.: _____

_____ Date Received by Contractor: _____

DESCRIPTION

Subject: _____

Drawing and Detail No./Date: _____

Schedule Title: _____

Contract Change: _____ Specification No./Date: _____

Bulletin No. Date: _____ Paragraph No.: _____

Other/Date: _____ Enclosures: _____

Description of Problem or Requested Information and Proposed Solution (if any):

By: _____ Response Requested By: _____
(RFI Manager)

SECTION 01 29 00 – PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

A. (Field) Review: Architect's visits to the site at intervals necessary in the judgment of Architect to become generally familiar with the progress and quality of the Work completed and to determine in general if the Work completed is in accordance with the Contract Documents. Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work.

1.3 SCHEDULE OF VALUES

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

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with Continuation Sheets.
    b. Submittals Schedule.
    c. Contractor's Construction Schedule.

2. Submit the Schedule of Values at earliest possible date but before the date scheduled for submittal of initial Applications for Payment.

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

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

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

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

    a. Related Specification Section or Division.

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

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

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

a. Break down principal subcontract amounts into separate labor and materials items. Breakdown of subcontractor's schedule of values must be true and accurate.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

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

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

1.4 APPLICATIONS FOR PAYMENT

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

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

B. Payment Application Review:

1. Prior to the 25th day of each month, furnish the Architect with a draft (pencil) copy of the Application for Payment.

2. On the 25th day of each month, the Owner, the Architect and the Contractor shall meet to review the draft (pencil) copy of the application and Certificate for payment. Questions resulting from this review shall be answered by the Contractor and clarified prior to receipt of the final copy of the Application and Certificate for Payment that is to be submitted to the Architect on the 1st day of the following month.
3. Upon receipt of the final Application and Certificate for Payment and other documentation as required by the Architect including the updated Schedule of Values and the updated Construction Schedule, the Architect shall review the documents received to determine if they correspond to the agreements reached during the draft (pencil) copy review. Upon completion of the Architect's review, the Architect shall revise and execute the Applications and Certificate for Payment to correspond to the agreements reached and forward the executed copies to the Owner.
4. In taking action on the contractor's Application and Certificate for Payment, the Architect will rely on the accuracy and completeness of the information furnished by the contractor and will not be deemed to represent that he has made audits of the supporting data.
5. Payment will not be made for materials and equipment stored off the site, except at the Owner's discretion and prior approval. When the Application and Certificate for Payment includes material or equipment stored off-site, the Application shall be accompanied by a statement certifying:

    a. Description of the item(s) being stored.
    b. Location of the bonded warehouse(s) where materials or equipment is being stored.
    c. Affidavit of Storage.
    d. Certificate of Insurance.
    e. Bill of sale made to Owner stating there will be no additional cost for transportation and delivery of the item(s) being stored.
    f. Statement certifying that item or any part thereof will not be installed in any construction other than work under this Contract.

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

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

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

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

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

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

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

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

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

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

1. List of subcontractors, principal suppliers and fabricators.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
8. Copies of building permits.
9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
10. Report of preconstruction conference.
11. Certificates of insurance and insurance policies.
12. Data needed to acquire Owner's insurance coverage(s).
13. Performance and payment bonds.
14. Data needed to acquire Owner's insurance.

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

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

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

1. Evidence of completion of Project closeout requirements, including, but not limited to:

    a. Transmittal of required Project Record Documents to Owner.
    b. Evidence of completion of demonstration and training.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims" and AIA Document G706A, "Contractor's Affidavit of Release of Liens."
5. Evidence that claims have been settled.
6. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
7. Final, liquidated damages settlement statement.
8. Occupancy permits and similar approvals or certifications by governing authorities and franchised services, assuring Owner's full access and use of completed work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project.

1.2 COORDINATION

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

1.3 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

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

1.4 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record minutes in writing. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.
4. Notification: Inform participants 3 days prior to meetings not regularly scheduled.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect. Hold the conference at a convenient location. Conduct the meeting to review responsibilities and personnel assignments.

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

D. Progress Meetings: Conduct progress meetings at weekly intervals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 SUBMITTALS

A. Submittals Schedule: Within 30 days after the execution of the Agreement between the Owner and the Contractor submit to the Architect and Owner copies of the submittals schedule. Arrange the following information in a tabular format:

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

B. Contractor's Construction Schedule: Submit, for the Owner's and Architect's information, copies of the Contractor's Construction Schedule, large enough to show entire schedule for entire construction period.

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

1.3 COORDINATION

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

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit, for Architect's approval, concurrently with the Contractor's Construction Schedule a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include the following information:

1. Anticipated date of Architect's receipt of submittal.
2. Number of business days allowed for Architect's review of submittal.
3. Specification Section to which submittal relates.

4. Subcontractor, fabricator or supplier responsible for preparing the submittal.
5. Provide blank columns for actual date of submittal, re-submittal, and final-review status.
6. Systems Submittals: Identify submittals for systems such as fire alarms, and sprinklers, on the transmittal and act upon the system singularly as a combined submittal.

B. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

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

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

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

1. Activity Duration: Define activities so no activity is longer than 20 days.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Include selection process activities for finishes and products specified by allowances or specified to be selected during the sample review process. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than five (5) days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for administrative procedures necessary for certification of Substantial Completion.

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

1. Phasing: Arrange list of activities on schedule by phase.
2. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Use of premises restrictions.

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

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

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Immediately after being awarded the Contract, prepare and submit, for the Owners and Architect's information, a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule. The schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for the expeditious and practical execution of the Work.

1. Allow a minimum of 10 working days for processing (from date Architect receives submittal until date he sends it back) and sufficient time for proper handling, review, fabrication and delivery.

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

2.4 REPORTS

A. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities.

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

END OF SECTION 01 32 00

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: At Contractor's written request, electronic copies of Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to the Contract Documents.

1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
2. Provide an executed Data Transfer Agreement form, at the end of this Section, from each subcontractor and sub-subcontractor or supplier.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Promptly submit Shop Drawings, Product Data, and Samples in accordance with the accepted submittal schedule, as to cause no delay in the Work. Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. Architect will document on submittal the date of receipt. Submittals delivered to the Architect after 4 pm will be noted as received on the next business day.

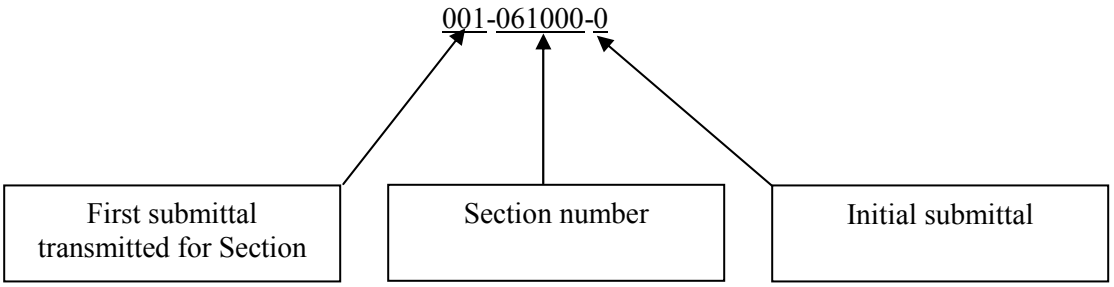
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination. Delaying submittals to facilitate coordination between submittals shall not constitute a delay of the Work nor shall it be the basis for an extension of time.
2. Sequential Review: Sequential review is a submittal that requires review by more than one design discipline. Where sequential review of submittals by Architect's consultants, Owner, or other parties is required, submittal schedule shall reflect sequential review.
3. Direct Transmittal to Consultant for Concurrent Review: Transmit submittals directly to Architect's consultants, provide duplicate copy of transmittal to Architect . Allow 15 days for initial review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
4. If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Allow 15 days for review of each resubmittal.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 5 inches by 6 inches on label or beside title block to record Architect's review markings.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name and address of Contractor.
    e. Name and address of subcontractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Unique identifier, including revision number. Submittals shall be numbered with a three-digit number, followed by a dash, followed by the Section number, followed by another dash, and ending with a sequential submission number as indicated below. The numbering system shall be retained throughout all revisions.

        1) Three-Digit Number: Sequential number, beginning with "001", for each submittal transmitted to Architect for each Section.
        2) Section Number: Section number where submittal is specified.
        3) Submission Number: Use "0" for initial submittal, "1" for first resubmittal, "2" for second resubmittal, and so forth.



i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.
m. Submission Number: Use "0" for initial submittal, "1" for first resubmittal, "2" for second resubmittal, and so forth.

E. Options: Identify options requiring selection by the Architect.

F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

G. Additional Paper Copies: Unless corrected copies are required for final submittal due to Architect's observance of noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.

I. Transmittal Form: Use the attached form with each submittal.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "A" or "B" from Architect's action stamp.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals with mark indicating action "A" or "B" taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 SUBMITTALS PROCEDURES

A. General: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Action Submittals: Submit three paper copies of each submittal, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
2. Informational Submittals: Submit two paper copies of each submittal, unless otherwise indicated. Architect will not return copies.
3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

    a. Provide a notarized statement on original paper copy certificates and certifications where indicated.

5. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Clearly mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's written recommendations.
    c. Manufacturer's product specifications.
    d. Manufacturer's installation instructions.
    e. Standard color charts.
    f. Mill reports.
    g. Standard product operating and maintenance manuals.
    h. Compliance with recognized trade association standards.

i. Compliance with recognized testing agency standards.
j. Application of testing agency labels and seals.
k. Notation of coordination requirements.
l. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams showing factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

a. Paper copies.

C. Shop Drawings: Prepare and submit Project-specific information, drawn accurately to scale. Do not reproduce, digitally or otherwise, the Contract Documents and submit them as shop drawings. Contractor, subcontractors, suppliers and all other entities shall not use, copy or reproduce title blocks, dimensions, notes, keynotes, symbols schedules or details from Contract Drawings, digital or otherwise. Use of the Contract Drawings shall be limited to reproduction, digitally or otherwise, of the exterior wall layout, interior partition layout, grid lines, doors, and windows. Do not base Shop Drawings on standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship and attachment to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Submit Shop Drawings in the following format:

a. Opaque paper copies.

D. Samples: Submit physical units of materials or products.

1. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set[s] of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set[s]; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:

    a. Generic description of Sample.
    b. Product name or name of manufacturer.
    c. Sample source.

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

    a. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
    b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

6. Systems Submittals: Identify submittals for systems such as fire alarms, exterior walls, and curtain walls, on the transmittal and act upon the system singularly as a combined submittal. If resubmission is required, resubmit entire system submittal.

7. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

E. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for action required.

F. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

G. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

I. Qualification Data: Submit written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

J. Welding Certificates: Prepare and submit written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

K. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements.

L. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements.

M. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

N. Research Reports: Submit written evidence, from [a model code organization acceptable to authorities having jurisdiction] <Insert name of model code organization, ie, ICC-ES, >, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.

7. Limitations of use.

O. Maintenance Data: Submit written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Closeout Procedures."

P. Manufacturer's Instructions: Submit written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

Q. Manufacturer's Field Reports: Prepare and submit written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

R. Insurance Certificates and Bonds: Prepare and submit written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

S. Extra Stock: Comply with requirements specified in individual Sections for quantity and disposition of delivery of extra stock.

2.2 DELEGATED-DESIGN SERVICES

A. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the

responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, coordinated, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each properly executed submittal, make marks to indicate corrections or modifications required, and return it. Architect will reject and return submittals not complying with requirements. Architect will stamp each submittal with a stamp and will mark stamp appropriately to indicate action, as follows:

1. A - No Exceptions Taken. No further review of Submittal required.
2. B - Make Corrections as Noted. Incorporate corrections in Work; resubmittal is not required. If Contractor cannot comply with corrections as noted, revise to respond to exceptions and resubmit.
3. C - Revise as Noted and Resubmit. Revise as noted & resubmit for further review.
4. D - Resubmit Properly. Submittal not reviewed because it does not contain Contractor's signature indicating its review and approval, and/or is not in proper condition for review. Resubmit.
5. E - Not Reviewed. Submittal is not required by Contract Documents.
6. F - Received for Client's Record Only. Submittal not reviewed.

C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Incomplete submittals are not acceptable, will be considered non-responsive, and will be returned without review.

1. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Submittals not required by the Contract Documents will not be reviewed and may be discarded or returned marked "Not Reviewed."

F. Substitution items received as product data, shop drawing, or sample submittals required by individual Sections will be returned to Contractor without review. Comply with requirements in Division 01 Section "Product Requirements" for submission of substitution request.

END OF SECTION 01 33 00

SUBMITTAL
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September 1996
CSI Form 12.1A

SUBMITTAL REVIEW

A **NO EXCEPTIONS TAKEN.**
B **MAKE CORRECTIONS AS NOTED.** Resubmittal not required unless Contractor cannot comply with corrections noted.
C **REVISE AS NOTED AND RESUBMIT.**
D **RESUBMIT PROPERLY.** Submittal not reviewed for reasons noted.
E **NOT REVIEWED.** Submittal not required by Contract Documents.
F **RECEIVED FOR CLIENT'S RECORD ONLY.** Submittal not reviewed.

Gensler has reviewed this Submittal, but only for the purpose of checking for conformance with the design intent expressed in the Contract Documents. Gensler's action on a specific item does not indicate approval of an assembly of which the item is a component, nor of an item as delivered and installed if it does not conform to the Contract Documents.
Contractor is responsible for checking for deviations between this Submittal and differing information or conditions in the Contract Documents and field conditions; for determining or substantiating the accuracy and completeness of other details such as dimensions and quantities; for substantiating instructions for installation or performance of equipment or systems designed by Contractor; for construction means, methods, techniques, schedules, sequences, procedures, and fabrication processes; for errors and omissions in Submittals; for coordination of the Work of the trades, safety precautions and performing the Work in a safe and satisfactory manner and in conformance with the Contract Documents. If more than one submittal review stamp appears on this Submittal, the most stringent action and notations thereon apply. Signature of a submittal review stamp by Gensler or a consultant does not imply that it has reviewed work not within its professional discipline or scope of services.

By ____________________________ Date _____________________

Project No. _____________________ Submittal No. ______________

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By ____________________________ Date _____________________

Project No. _____________________ Submittal No. ______________

SECTION 01 40 00 – QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

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

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

C. Related Sections include the following:

1. Division 01 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
2. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

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

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

C. Mockups: Full-size assemblies erected on-site and used to demonstrate qualities of materials and execution; to review construction, coordination, testing or operation; to illustrate finishes and materials; to verify selections make under Sample submittals; and to demonstrate aesthetic effects. Mockups are not Samples. Mockups establish the standard by which Work will be judged.

1. Benchmark Samples: A type of mockup used to illustrate the application and aesthetic effect of finishes and coatings. Benchmark Samples establish the standard by which the Work will be judged.

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

1.3 DELEGATED DESIGN

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

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

1.4 SUBMITTALS

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

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

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

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.

D. Testing Agency and Inspection Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

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

1.5 QUALITY ASSURANCE

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

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

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

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

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

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

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

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

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

1. Contractor responsibilities include the following:

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

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

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

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

1.6 QUALITY CONTROL

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

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

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

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

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

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
6. Provide quality assurance and control services required due to changes in the Work proposed by or made by the Contractor.
7. Provide quality control services for Work done contrary to the Contract Documents, without prior notice, when so specified, or without proper supervision.
8. Overtime expenses and schedule delays accruing as a result of executing quality control services shall be the Contactor's responsibility and shall not be charged to the Owner.

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

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

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

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

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

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

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

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

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

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

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule with Contractor's Construction Schedule as specified in Division 01 Section "Construction Progress Documentation."

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

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

1. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

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

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

END OF SECTION 01 40 00

SECTION 01 42 00 – REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

E. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

F. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

G. "Provide": Furnish and install, complete and ready for the intended use.

H. "Installer": Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations. Installers shall be experienced in the operation they are engaged to perform.

I. "Experienced": Unless otherwise specified in the technical sections when used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

J. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings.

K. "As Required": As required by regulatory bodies, by referenced standards, by existing conditions, by generally accepted construction practice or by the Contract Documents. In the event of ambiguity or conflicts, the most stringent requirements shall apply.

L. "By Others" refers to work that is not a part of the Contract.

M. "N.I.C.": "Not in Contract" means the work or the item indicated is not a part of the Contract and will be provided by the Owner.

1.2 STANDARDS, REGULATIONS AND CODES

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum..

D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used, they shall mean the recognized name of the standards and regulations in the following list.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	 (800) 872-2253 (202) 272-5434

E. Abbreviations and Acronyms for Industry Standards and Regulations: Where abbreviations and acronyms are used they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(703) 358-2960
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
ADC	Air Diffusion Council www.flexibleduct.org	(847) 706-6750
AGA	American Gas Association www.aga.org	(202) 824-7000
AHA	American Hardboard Association	(847) 934-8800

	http://domensino.com/AHA/	
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
ARI	Air-Conditioning & Refrigeration Institute (now AHRI)	
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (973) 882-1170
ASPE	American Society of Plumbing Engineers www.aspe.org	(773) 693-2773
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9500
AWCI	Association of the Wall and Ceiling Industries International www.awci.org	(703) 534-8300
AWI	Architectural Woodwork Institute www.awinet.org	(571) 323-3636
AWPA	American Wood Protection Association (formerly American Wood-Preservers' Association) www.awpa.com	(205) 733-4077

AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CPA	Composite Panel Association www.pbmdf.com	(703) 724-1128
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
GA	Gypsum Association www.gypsum.org	(301) 277.8686
GANA	Glass Association of North America (formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com	(785) 271-0208
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IES	Illuminating Engineering Society www.ies.org	(212) 248-5000
MFMA	Metal Framing Manufacturers Association, Inc. www.metalframingmfg.org	(312) 644-6610
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(630) 942-6591
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110

NEMA	National Electrical and Medical Imaging Equipment Manufacturers Association www.nema.org	(703) 841-3200
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NWWDA	National Wood Window and Door Association (now WDMA)	
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIGMA	Sealed Insulating Glass Manufacturers Association	(312) 644-6610
SPIB	Southern Pine Inspection Bureau www.spib.org	(850) 434-2611
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
TCNA	Tile Council of North America, Inc. www.tileusa.com	(864) 646-8453
TIA	Telecommunications Industry Association www.tiaonline.org	(703) 907-7700
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577 (847) 272-8800
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

F. Federal Government Agencies: Where abbreviations and acronyms are used, they shall mean the recognized name of the entities in the following list.

CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-0990

DOC	Department of Commerce www.doc.gov	(202) 482-2000
OSHA	Occupational Safety & Health Administration www.osha.gov	(202) 693-1999

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary facilities and controls.

1. Provide and maintain all temporary facilities and controls necessary for the performance of the Work. Locate and install all temporary facilities and controls where acceptable to the local authorities having jurisdiction and utility owner and remove same and terminate, in a manner suitable to the local authorities having jurisdiction and utility owner, at completion of Work or when otherwise directed. Unless otherwise specified, pay all costs associated with the use, provision, and maintenance of, temporary facilities and controls including power, water, and fuel (if any) consumed until Substantial Completion.

1.2 PROJECT CONDITIONS

A. Use of Permanent Utilities: When each permanent utility is operational, it may be used for construction purposes, if acceptable, in writing, by the Owner. The written request for permission for use of the system from the Owner shall include, as a minimum, the conditions and reasons for use and provisions for and effect on equipment warranties. In the event that the Owner accepts the Contractors use of the permanent utility for the balance of the Work, the Contractor shall be fully responsible for it, and shall pay all costs for operation, power, restoration and maintenance of same.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

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

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the

remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction.

B. Ventilation and Humidity Control: Provide adequate ventilation in enclosed areas throughout construction period required to: facilitate progress of Work; to protect Work and products against dampness and heat; to prevent moisture condensation on surfaces; to provide suitable ambient temperatures for installation and curing of finish materials; to provide adequate ventilating; to meet health regulations for safe working environment; and, to prevent hazardous accumulations of dusts, fumes, mists, vapors or gases in areas occupied during construction. Provide local exhaust ventilating to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas. Dispose of exhaust materials in manner that will not result in harmful exposure to persons or property. Provide ventilating operations at all times personnel occupy an area, when subject to hazardous accumulations of harmful elements. Continue operation of ventilating system for as long as required after cessation of Work to assure removal of harmful elements.

1. In the event that the Owner accepts the Contractor's use of the permanent ventilation and air conditioning systems for the balance of the Work, provide and maintain temporary filters to adequately filter air being distributed through the ductwork and air handling units to the supply outlets; disposable filter shall be placed in front of all exhaust registers to keep construction dirt out of exhaust duct work.

C. Electric Power and Lighting Service:

1. Arrange with local electric utility for temporary electric service to the site. Provide all installation and equipment for temporary lighting and power. The electrical service shall be of adequate capacity for all construction tools and equipment without overloading the temporary facilities.

    a. Provide power distribution throughout the site as required to facilitate construction operations. Terminations shall be provided for each voltage supply complete with circuit breakers, disconnect switches and other electrical devices as required to protect the power supply system.
    b. A temporary lighting system shall be furnished, installed and maintained by the Contractor as required to satisfy the minimum requirements of security and safety. Provide general illumination for the entire project. Provide increased levels of illumination where the work is being installed.

2. All temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of the governing codes and regulations, the NEC, NEMA, and OSHA standards. All temporary power and lighting shall be maintained to give safe working conditions, continuous service, and so as not to pose a threat to the Owner's property. Modify and extend temporary power and lighting systems as the Work progress requires.

D. Telephone Service: Provide temporary telephone service throughout construction period. Long distance calls shall be paid for by the party making the call. A pay phone is not acceptable.

3.3 TEMPORARY SUPPORT FACILITIES AND PROTECTION

A. Project Identification and Temporary Signs: No Project identification, signs or advertisements will be permitted on the project site.

B. Construction Aids: Provide all items, such as lifting devices, all scaffolding, staging, platforms, runways, ladders; and all temporary flooring, as required by the various trades for the proper execution of the Work. Provide such construction aids with proper guys, bracing, guards, railings and other safety devices as required by the governing authorities and OSHA.

C. Security: Provide and maintain provisions for closing and locking the site to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

D. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

E. Temporary Fire Protection: Throughout the site, during construction, provide for fire protection and fire prevention in accordance with all applicable Federal, state and local codes and regulations.

3.4 TERMINATION AND REMOVAL

A. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Remove and dispose of temporary filters and thoroughly clean the interior of the air handling units and ductwork prior to acceptance of the Work. Provide all new filters in heating, ventilation and air conditioning systems.
2. Replace all lamps of the permanent lighting system, to comply with the Contract Documents, at no cost to the Owner.
3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 01 Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following administrative and procedural requirements for the selection of products for use in the Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and product substitutions.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form provided at end of Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, product material content, product manufacture, weight, size, durability, service life, maintenance, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Cost information, including a proposal of change, if any, in the Contract Sum.

j. Time value to be added to, or subtracted from, the Contract time of Completion.
k. Benefit(s) to the Owner.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation. Architect will notify Contractor of acceptance or rejection of proposed substitution. Substitution requests, if any, shall be submitted so as to allow a reasonable time for their consideration and shall not be justification for delay of the Work.

1.4 QUALITY ASSURANCE

A. General: All bids shall be based on the products required in the Contract Documents.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
8. Protect stored products from damage.

B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

PART 2 - PRODUCTS

2.1 PRODUCT SUBSTITUTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: Unless custom products or nonstandard options are specified, provide products of both quality and type that have been used successfully in similar situations on equal quality projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis of Design Products: Where paragraphs or subparagraphs titled “Basis of Design Product(s)” are included. Provide either the specified product or a comparable product. Drawings and specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
6. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

    a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.

7. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

C. Substitutions: Substitutions will be considered only under one of the following conditions:

1. That the specified product is not available due to lockout, strike, bankruptcy, product discontinuance, Acts of God, and that the proposed product will match or exceed the quality of the specified product while either providing the Owner with a cost savings or expediting the Work.
2. When a warranty of performance is specified and, in the judgment of the Contractor, the specified product will not provide the desired performance.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

Substitution Request

Gensler

Project	**Date**
Project Location	**Project Number**
General Contractor	**File** 6S
Prepared by	**This is page** 1 of

We certify that the following product is equal or superior to the specified product in appearance, durability, performance, and in every other respect, and we hereby submit it for your consideration as a substitute for the specified item for the above-mentioned project:

1. **Specified Item** **Section**
2. **Proposed Substitution**
3. **Reason for Substitution**
4. **Costs** (Provide a complete breakdown of costs, including the cost amount to be DEDUCTED from the Contract Sum if the proposed substitution is accepted. Include documentation for both materials and labor.)
5. **Schedule** (Describe substitution's affect on construction schedule)
6. **Supporting Data**
   - **Cutsheets: Attach complete technical data, including laboratory tests, if applicable.**
   - **Installation: Include complete information on changes to Drawings and/or Specifications describing the steps that the proposed substitution will require for its proper installation.**
   - **Samples: Submit with request all necessary samples and substantiating data clearly marked to prove equal quality and performance to that which is specified.**
7. **List ways in which the substitution affects dimensions shown on Drawings.**
8. **List affects of proposed substitution on other trades**
9. **List ways in which proposed substitution will be affected by applicable code requirements and agency approval**
10. **List differences between proposed substitution and specified item**
11. **Manufacturer's warranties of the proposed and specified items are:** ☐ **Same** ☐ **Different**

Explain

12. **List information on availability of maintenance service and source of replacement materials**
13. **Certification of, and Assumption of Liability for, Equivalent Performance**

The undersigned certifies that the function, appearance and quality of the proposed substitution is equivalent or superior to the specified item and is in full compliance with the Contract Documents and applicable regulatory requirements.

Supplier		**Signature**	
Telephone No.		**Date**	

Signature must be by person authorized to legally bind his/her firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

General Contractor		**Signature**	
Telephone No.		**Date**	

SECTION 01 73 00 – EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.3 CONSTRUCTION LAYOUT

A. General: The Work to be performed under the Contract Documents shall be laid out solely by the Contractor. Provide and pay for all construction layout work required for the Project. Under no circumstances will the Architect assume any responsibilities for laying out the Work.

1. Verify all dimensions shown on the drawings. Do not scale Drawings to obtain required dimensions. Notify the Architect in writing of any discrepancies found before proceeding or continuing with the Work.

B. Construction Layout: During the progress of the Work establish additional bench marks, reference lines and reference points and levels at each floor and as otherwise necessary for the guidance and information of each trade and for the field verification of specified construction

tolerances. Calculate and measure required dimensions within indicated or recognized tolerances.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

3.6 STARTING AND ADJUSTING

A. Start and test equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and or broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 73 29 – PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for patching.

B. Related Sections include the following:

1. Division 07 Section "Penetration Firestopping" for patching fire-rated construction.
2. Divisions 02 through 49 Sections for specific requirements and limitations applicable to patching individual parts of the Work.

a. Requirements in this Section apply to mechanical and electrical installations. Refer to notations on drawings for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.2 DEFINITIONS

A. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 SUBMITTALS

A. Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe patching, show how it will be performed, and indicate why it cannot be avoided.
2. Products: List products to be used and firms or entities that will perform the Work.
3. Dates: Indicate when patching will be performed.
4. Utilities: List utilities that patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
5. Structural Elements: Where patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
6. Architect's Approval: Obtain approval of patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Structural Elements: Do not patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.
2. Air barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Electrical wiring systems.

C. Miscellaneous Elements: Do not patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Equipment supports.
4. Piping, ductwork, vessels, and equipment.
5. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not patch construction in a manner that results in visual evidence of cutting and patching. Do not patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

a. Processed concrete finishes.
b. Roofing.
c. Firestopping.
d. Window wall system.
e. Wall covering.
f. HVAC enclosures, cabinets, or covers.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be patched and conditions under which patching is to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform patching. Proceed with patching at the earliest feasible time, and complete without delay.

B. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall

coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01 73 29

SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Submit specific warranties, workmanship bonds, final certifications, and similar documents.
3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
4. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
5. Submit test/adjust/balance records.
6. Complete final cleaning requirements, including touchup painting.
7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment.
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy

of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.5 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data:

a. Emergency instructions and procedures.
b. System, subsystem, and equipment descriptions, including operating standards.
c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
d. Description of controls and sequence of operations.
e. Piping diagrams.
f. Noise and vibration adjustments.
g. Effective energy utilization.

2. Maintenance Data:

a. Manufacturer's information, including list of spare parts.
b. Name, address, and telephone number of Installer or supplier.
c. Maintenance procedures.
d. Maintenance and service schedules for preventive and routine maintenance.
e. Maintenance record forms.
f. Sources of spare parts and maintenance materials.
g. Copies of maintenance service agreements.
h. Copies of warranties and bonds.
i. Cleaning.
j. Control sequence.
k. Fuels, lubricants, tool, and other related items.
l. Identification systems.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties for designated portions of the Work.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Remove tools, construction equipment, machinery, and surplus material from Project site.
b. Clean exposed hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.
c. Remove debris and surface dust from limited access spaces, including plenums, shafts, and similar spaces.
d. Sweep concrete floors broom clean in unoccupied spaces.
e. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
f. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
g. Remove labels that are not meant to be permanent.

h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over or remove "UL" and similar labels, including mechanical and electrical nameplates.

i. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

j. Replace parts subject to unusual operating conditions.

k. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

l. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

m. Clean ducts, blowers, and coils if units were operated without filters during construction.

n. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in lighting fixtures to comply with requirements for new fixtures.

o. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

Certificate of Substantial Completion

Gensler

Project	**Project Number**
Project Location	**Date Issued**
Owner / Client	**File** 6SC
Contractor	**This is page** 1 of
Contract Date	
Date of Substantial Completion	

Date of Substantial Completion is applicable to ☐ **Entire Project** ☐ **Designated Portion of Project, as described below**

Punch List ☐ **Attached** ☐ **Transmitted Separately** ☐ **None**

The Work performed under the Contract for Construction has been reviewed and found, to Architect's best knowledge, information and belief, to be substantially complete as of the Date of Substantial Completion entered above. The Date of Substantial Completion is the date when the Work, or designated portion thereof, is sufficiently complete in accordance with the Contract Documents (including any approved change Orders) and all required final inspections and permits have been obtained so Owner can occupy or utilize the Work for its intended use, subject only to completion of minor items (Punch List).

The Work, or designated portion thereof shall include:

A list of items to be completed or corrected and the date(s) when such items are to be completed (Punch List) may be attached hereto or transmitted separately. This Certificate of Substantial Completion, or omission of any item from the Punch List shall not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The Architect shall not be responsible for any omission from, or other discrepancy on, the Punch List. Contractor agrees to complete or correct the items listed on the Punch List within days of the above date of Substantial Completion.

Warranties required under the Contract Documents shall commence on the Date of Substantial Completion, except for Punch List items and other incomplete work, warranties for which shall commence on the date such work is satisfactorily completed, unless otherwise agreed in writing by Owner and Contractor.

The Owner and Contractor shall fulfill and transfer responsibilities with regard to insurance, utilities, maintenance, damage, security, surety, and the like, in accordance with the Contract Documents or other written agreement between them.

The Architect has conducted no tests for, and made no determination of the presence or lack of asbestos or other hazardous or toxic substances or pollutants.

The Basic Services of the Architect shall end 30 days after the Date of Substantial Completion, unless otherwise stated in the Owner/Architect Agreement or agreed in writing.

Begin text here . . .

Architect Gensler	**By**	**Date Signed**
Owner/Client	**By**	**Date Signed**
Contractor	**By**	**Date Signed**

SECTION 03 35 00 - CONCRETE POLISHING, PROCESSING & FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Concrete processing/polishing using a multi-step wet/dry process of the concrete surface through means of a mechanical process that uses an abrasive medium where each step is refined to its purest possible form on a microscopic level from one progressively finer abrasive to the next until the desired level of finish or polish is achieved. The process includes the use of a hardener or densifier and is for new concrete floors.

1.2 SUBMITTALS

A. Changes in specification may not be made after the bid date.

B. Submit under provisions of Section 01 33 00.

C. Product Data:

1. Manufacturer and model of all abrasives.
2. Manufacturer and model of equipment that mechanically rotate abrasives.
3. Manufacturer, product and technical data sheet of Hardener / Densifier.
4. Manufacturer, product and technical data sheet of Stain / Dye.

D. Installer's Accreditation and Certification:

1. Letter from the Technical Institute for Polished Concrete stating Installer holds a valid
2. and current accreditation. Levels of accreditation can be found at www.polishinginstitute.org, 410-626-7471 or info@polishinginstitute.org
3. Letter stating that installer has been certified by the manufacturer of the Hardener/Densifier to be used.

E. Installer's Job References:

1. Listing of five similar projects that are more than one year old. Provide physical address and contact information for each. Include the manufacturer and product-make-model of the hardener/densifier used, equipment used to drive the abrasives and abrasives steps completed.

F. Maintenance:

1. Installers cleaning and maintenance recommendations for finished surface.

1.3 QUALITY ASSURANCE

A. Installer's Qualifications:

1. Installer shall have a minimum of 5 years experience and hold an accreditation from the Technical Institute for Polished Concrete, with no less than 5 similar projects that are older than one year, and shall provide trained laborers with prior experience in the type of construction involved as well as experience installing the specified process. www.polishinginstitute.org, 410-626-7471 or info@polishinginstitute.org
2. Installer shall have a minimum of 1 year experience in applying specified hardener / densifier, with no less than 5 similar projects product was used and shall provide trained laborers with prior experience in the type of construction involved as well as experience in applying specified product.

B. Mockups:

1. Used by the architect as a reference and general guide as to the appearance of the finished product.
2. 7' x 7' in size and in an area directed by Architect.
3. Produced using specifications specified for areas to receive concrete processing or polishing.
4. To be placed and finished by the same concrete flat work contractor responsible for pouring and placing permanent flatwork using the same finishing procedures as specified in Division 03 Section "Cast in Place Concrete."
5. Used to show Level of cut / aggregate exposure based on the following criteria:

    a. Level 1- Cream Finish- polishing only the portland paste at the surface of the substrate without exposing small, medium or large aggregate. (note* this particular level will require additional coordination with Section 03 33 00 Cast in Place concrete; concrete mix design; concrete finishing procedures.)
    b. Level 2- Salt/Pepper Finish- exposing the fine aggregate such as sand and small aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within $1/16^{th}$ inch of the surface.
    c. Level 3- Medium Aggregate- exposing more of the overall girth of the aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within $1/8^{th}$ inch of the surface.
    d. Level 4- Large Aggregate-exposing the overall girth of the aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within 1/4 inch of the surface.

6. Used to show level of sheen when the concrete surfaced is mechanically processed as specified in 3.03 INSTALLATION:

    a. Level A sheen (satin) as determined by gloss reading of 45-60.
    b. Level B sheen (semi-gloss) as determined by gloss reading of 60-70.
    c. Level C sheen (high gloss) as determined by gloss reading of 70 or higher.
    d. NOTE: GLOSS READINGS ARE NOT TO BE OBTAINED THROUGH THE USE OF ANY MICROFILMING PRODUCTS, SEALERS, COATING, ENHANCERS OR THE RESULT OF RESIN TRANSFER FROM RESIN BOND ABRASIVES.

7. Used to show clarity of the cut surface, color, natural variations, decorative applications such as saw cut or engraving and quality of workmanship.
8. Concrete processing to be performed with the same abrasives, equipment, hardeners/ densifiers and dye to be used in processing permanent flatwork.
9. If determined mockups do not meet architect's requirements General Contractor will remove and replace mockups until architect approval is given.
10. General Contractor to notify architect 14 days prior to mockup construction and finishing.
11. General Contractor is to maintain mockups during construction and will be used as a general reference to the finished product.
12. Mockups may be incorporated into finished work.
13. General Contractor will be responsible for removal and disposal of mockups.

C. Pre-Installation Meeting:

1. New Flat Work:

a. New: All parties that influence the results of the polishing process must attend including Polishing/Processing Installer, Flat Work Contractor, Architect, General Contractor and Parties responsible for assuring concrete mix design.

2. Determine at what stage in construction floors are to be finished.
3. Review how all parties are to work together and how each influences final results.

D. Protection of surface before and after processing or polishing installation is the responsibility of the General Contractor and shall include:

1. Diaper all equipment.
2. Vehicles are not permitted on surface.
3. Do not allow acids to contact surface.
4. Do not place any material onto surface that may cause staining, etching or scratching.
5. Remind all trades they are working on a surface that is to become a finished surface.

E. The contractor shall conform to regulatory requirements set forth in Section 01 41 00 as well as comply with all applicable EPA, OSHA, State, regional and local codes and regulations.

1.4 REFERENCES

A. ASTM C 779/C779M-05 – Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.

B. ASTM C 805 – Standard Test Method for Rebound Number of Hardened Concrete.

C. ASTM E 430 – Standard Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry.

D. ASTM E 1155 – Standard Test Method for Determining Floor Flatness and of Levelness Using the F number system.

E. ACI 302.1R-89 - Guide for Concrete Floor and Slab Construction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in unopened packaging until ready for installation with packages clearly labeled with the manufacturer's name, type, and, if applicable, color.

B. Store in a cool place, preferably under cover, at temperatures between 40 and 90 degrees F (4 and 32 degrees C).

C. Protect from freezing.

D. Store and dispose of solvent-based materials in accordance with requirements of local authorities having jurisdiction.

E. Do not stack buckets more than three high.

1.6 PROJECT CONDITIONS

A. General Contractor is to maintain temperature, humidity, and ventilation within limits recommended by manufacturer of any products used for application.

B. General Contractor is to have job site lighting operational and provide sufficient light for the process.

C. General Contractor is to maintain ambient temperature of 55 degrees minimum and 80 degrees maximum to allow for proper curing of hardeners or densifiers.

D. General Contractor is to provide a dumpster within 50 feet of job site to dispose of material produced during concrete processing process one day before work is scheduled to start.

E. General Contractor is to provide water within 50 feet of work area one day before work is scheduled to start.

F. General Contractor is to provide electrician to hook up power requirements for Installer one day before work is scheduled to start.

G. General Contractor is to provide power within 50 feet of work site and able to handle the concrete processing Installer's power requirements one day before work is scheduled to start.

H. General Contractor is responsible to provide Installer a broom swept floor before work begins.

I. General Contractor is responsible for removing all debris from floor joints before Installer begins work.

J. No other trades allowed in area being work on by Installer and area is to be free and clear of anything that would prevent work from progressing in a timely manner.

K. In the event solvent based stains are used anything that produces sparks or flames must be turned off.

L. Smoking is not permitted.

M. Process is to be performed before framing or after framing but before drywall or after framing and drywall but before door jambs, paint and base molding.

1.7 WARRANTY

A. The hardener or densifier manufacturer shall furnish a minimum 10-year material limited warranty, from the date of installation.

PART 2 - PRODUCTS

2.1 INSTALLER

A. Installer must be accredited by the Technical Institute for Polished Concrete. www.polishinginstitute.org, 410-626-7471 or info@polishinginstitute.org

2.2 MATERIALS

A. Abrasives are to be tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their abrasives and pictures of jobs completed by those Installers. Hardness of abrasive must be matched with hardens of concrete. All resin abrasives must be from the same manufacturer, make and model.

B. Grinding, Honing and Polishing Equipment manufacturer is to be one having tried and proven equipment in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their equipment and pictures of jobs completed by those Installers.

C. Auto Scrubber manufacturer is to be one having tried and proven equipment in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their equipment. Unit must have adequate downward head pressure to thoroughly clean floor.

D. Dry Dust Vacuum system manufacturer is to be one having tried and proven equipment in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their equipment. System must capture dust and debris to meet OSHA air quality standards.

E. Stain / Dyes must be from a manufacturer whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their stains / dyes and pictures of jobs completed by those Installers.

F. Saw Cutting and Engraving Equipment manufacturer is to be one having tried and proven equipment in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their equipment and pictures of jobs completed by those Installers.

G. Hardener/Densifier must be VOC compliant and have third party data showing performance results whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their hardener/densifier and pictures of jobs completed by those Installers that are greater than three years old.

H. Impregnating Micro Filming Stain Inhibitor must be VOC compliant and have third party data showing performance results whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their impregnating micro filming stain inhibitor and pictures of jobs completed by those Installers that are greater than one year old.

I. Joint Filler must be VOC compliant and have third party data showing performance results whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their joint filler and pictures of jobs completed by those Installers that are greater than three years old.

J. Crack Repair Material must be VOC compliant and have third party data showing performance results whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using crack repair material and pictures of jobs completed by those Installers that are greater than one year old.

K. Patching Material must be VOC compliant and have third party data showing performance results whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their patching material and pictures of jobs completed by those Installers that are greater than one year old.

L. Cement Binder Repair material must be VOC compliant whose product is tried and proven in a field setting. If requested the manufacturer must supply 10 references of Installers currently using their equipment and pictures of jobs completed by those Installers that are greater than two years old.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Flat Work Requirements:

1. New Construction:

a. General Contractor is required to Confirm Slab Requirements as outlined here and in Division 03 Section Cast In Place Concrete through the use of a third party testing company:

1) Concrete must be cured for a minimum of 28 days.
2) Minimum of 3,500 – 5,000 PSI at 28 days.
3) Confirm slab has floor flatness rating of at least 50, with a minimum of 40
4) Confirm slab has floor levelness rating of at least 35, with a minimum of 35
5) Power troweled, not burned and no hand finishing.
6) If fine aggregate finish with minimum aggregate has been specified confirm concrete was vibrated and was thoroughly floated and tamped.

b. If flat work preparation is the responsibility of another contractor, immediately notify Architect of unsatisfactory condition. Do not proceed until surface is in

compliance with specified and installers recommendations or unless otherwise in writing agreed upon between Installer and Architect.

c. Identify and rectify any conditions and/or concerns that will affect final finish. Do not begin installation until substrates have been properly prepared unless otherwise in writing agreed upon between Installer and architect.

d. Confirm all conditions as outlined in 1.07 PROJECT CONDITIONS have been met.

3.2 PREPARATION

A. All surrounding areas are to adequately be protected from concrete processing and polishing process.

B. Remove all adhesives, oil, grease, dirt and previous coatings, sealers, curing agents, bond breakers and other contaminate that would affect the final finish.

C. Patching of loose, crumbly or deteriorated concrete must be removed and those areas repaired in accordance with manufacturer's instructions with Patching Material specified in Article 2.02.

D. Cracks repaired in accordance with manufacturer's instructions with Crack Repair Material specified in Article 2.02.

E. Joints filled in accordance with manufacturer's instructions with Joint Filling Material specified in Article 2.02.

3.3 INSTALLATION

A. The process is to be performed wet with all grits below 150 resin and wet or dry for the balance of the processes unless the Installer provides vacuums designed specifically for dry polishing concrete. If dry grinding with metal abrasives, Installer must maintain air quality that meets or exceeds OSHA air quality standards.

B. The Installer is to determine what grit to start the process to reach specified aggregate exposure.

1. Level 1- Cream Finish- polishing only the portland paste at the surface of the substrate without exposing small, medium or large aggregate. (note* this particular level will require additional coordination with Section 03 33 00 Cast in Place concrete; concrete mix design; concrete finishing procedures.)
2. Level 2- Salt/Pepper Finish- exposing the fine aggregate such as sand and small aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within $1/16^{th}$ inch of the surface.
3. Level 3- Medium Aggregate- exposing more of the overall girth of the aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within $1/8^{th}$ inch of the surface.
4. Level 4- Large Aggregate-exposing the overall girth of the aggregate within the substrate. The depth of grind will depend greatly on placement and finishing procedures. Generally, this level of grind can be achieved within 1/4 inch of the surface.

5. NOTE: GLOSS READINGS ARE NOT TO BE OBTAINED THROUGH THE USE OF ANY MICROFILMING PRODUCTS, SEALERS, COATING, ENHANCERS OR THE RESULT OF RESIN TRANSFER FROM RESIN BOND ABRASIVES.

C. Final grit performed per finish specifications to achieve the following using the mechanically process as specified in this Section - 3.03 INSTALLATION:

1. Level A sheen (satin) as determined by gloss reading of 45-60.
2. Level B sheen (semi-gloss) as determined by gloss reading of 60-70.
3. Level C sheen (high gloss) as determined by gloss reading of 70 or higher.

D. The number of abrasives under the equipment will be dictated by the specified head pressure needed for proper abrasion to occur by the abrasive manufacturer.

E. A minimum of two passes in different direction per grit is required.

F. At no time are any consecutive grits to be skipped following the starting grit abrasive.

G. The Installer will drop back one grit resin abrasive from the last metal grit abrasive used. A separation in grit designation size must be a minimum of 50 when transitioning from metal to resin.

H. The Installer will refine the concrete surface with each grit abrasive to its maximum potential before moving on to the next consecutively finer grit. The Installer must refine the concrete surface further than replacing the scratch pattern from the previous grit abrasive with the next grit abrasive.

I. Each wet grit after 100 metal must be refined until the slurry becomes translucent in the middle and clear around the edges.

J. Each dry grit abrasive after 100 resin must be refined until the abrasives flowingly move across the surface.

K. An auto scrubber must be used to clean the floor in between each grit until any particulate grit larger in size then what the next grit cut will produce has been removed from the floor before continuing to the next progressively finer grit.

L. Process:

1. Removal of Pre-Existing Materials:

a. Remove coatings, sealers, curing agents, bond breakers and glue using an abrasive designed for the particular removal application and one that will cause the least amount of damage to the surface.
b. Be mindful of the specified aggregate exposure.

2. Grinding:

a. Aggregate Exposure: The Installer is to determine what grit to start the process to reach specified aggregate exposure.
b. Work too and stay within specified layer of aggregate.

c. Metal abrasive grinding shall not go any higher than 220 unless special circumstances present themselves and approved by architect.

3. Dye:

a. Dye shall be applied according to manufacturer's directions.

4. Harden /Densifiy:

a. Application of a densifier will be dictated by the concrete but will not be applied any later than 150 grit resin unless special circumstances present themselves and approved by the architect.
b. Densifier shall be applied according to manufacturer's directions.

5. Honing:

a. Start Honing with 100/120 grit resin.
b. Follow with 100/120 grit resin with 200/220 grit resin.
c. Follow with 200/220 grit resin with 400 grit resin.

6. Polishing:

a. Clarity of reflection and durability: End processing at the specified level of clarity of reflection.
b. Start Polishing with 800 grit resin.
c. Follow 800 grit resin with 1500/1800 grit resin.
d. Follow 1500/1800 grit resin with 3000/3500 grit resin.

7. Inspection

a. Surface must be free from any random scratch patterns.
b. All edges must be uniformly cut and processed when compared to the rest of the floor.
c. Corrections to be made prior to application of Impregnating Micro Filming Stain Inhibitor.
d. Perform necessary gloss readings to determine specified gloss level prior to application of Impregnating Micro Filming Stain Inhibitor.

8. Impregnating Micro Filming Stain Inhibitor:

a. Thoroughly clean floor removing all dust and debris.
b. Apply according to manufacturer's directions.
c. Do not over apply product that creates an excessive topical application.

9. Perform final buff with burnisher operating at no less than 1500 rpm and pad.

M. All parties involved understand that the concrete processing contractor's finished results are largely dependent on what they are provided to work with and that the final product is consistently inconstant. Exposure of aggregates within the concrete or seeded will vary when exposed and not be consistent like a product manufacturer in a factory like controlled setting.

3.4 CLEANING & WASTE DISPOSAL

A. Perform site clean-up in accordance with Section 01 74 00. Remove all excess materials, tools and rubbish from site.

B. Follow all EPA guidelines for prompt removal and disposal of waste materials.

END OF SECTION 03 35 00

SECTION 04 20 00 – UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units at exterior screen wall.

1.2 SUBMITTALS

A. Product Data: For each masonry unit, accessory, and other manufactured product indicated.

B. Shop Drawings: For masonry reinforcing bars; comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.

C. Material Test Reports: For each type of masonry unit, mortar, and grout required.

1.3 QUALITY ASSURANCE

A. Mockup: Build sample panel for exposed unit masonry assembly to verify selections made under sample Submittals and to demonstrate aesthetic effects and quality of materials and execution.

1. Build mockup as indicated or as instructed by Architect.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements in ACI 530.1/ASCE 6/TMS 602.

B. Hot-Weather Requirements: When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 Articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 MASONRY UNITS

A. Concrete Masonry Units: ASTM C 90.

1. Unit Compressive Strength: 2150-psi- (14.8-MPa-) minimum, average net-area compressive strength.
2. Weight Classification: Medium weight.
3. Type: II, nonmoisture-controlled units.
4. Special Shapes: Provide for corners, control joints, bonding, and other special conditions.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Cement: ASTM C 1329.

1. Products:

a. Blue Circle Cement; Magnolia Superbond Mortar Cement.
b. Lafarge Corporation; Lafarge Mortar Cement.

D. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

1. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

E. Aggregate for Grout: ASTM C 404.

F. Cold-Weather Admixture: Not allowed.

G. Water: Potable.

2.4 REINFORCING

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

B. Masonry Joint Reinforcement: ASTM A 951; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.

1. Wire Size for Side Rods: W1.7 or 0.148-inch diameter for 1/4 to 3/8 inch joints(3.8-mm for 6 to 9 mm joints) .
2. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter for 1/4 to 3/8 inch joints.(3.8-mm diameter for 6 to 9 mm joints).
3. Single-Wythe Masonry: Use either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches (407 mm) o.c.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene.

B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall. Made from styrene-butadiene-rubber compound complying with ASTM D 2000, Designation M2AA-805.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.6 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup (0.14-L) dry measure tetrasodium polyphosphate and 1/2-cup (0.14-L) dry measure laundry detergent dissolved in 1 gal. (4 L) of water.

2.7 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, unless otherwise indicated. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.

1. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
2. For exterior, above-grade, non-load-bearing walls and for other applications where another type is not indicated, use Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

2.8 SOURCE QUALITY CONTROL

A. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cut masonry units with motor-driven saws. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

D. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

3.2 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

D. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

3.4 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction.

3.5 MASONRY JOINT REINFORCEMENT

A. Provide continuous masonry joint reinforcement as indicated. Install with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

B. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections.

3.6 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.7 CLEANING

A. Clean unit masonry by dry brushing to remove mortar fins and smears before tooling joints, as work progresses.

B. After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

END OF SECTION 04 20 00

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes cold-formed metal framing.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads without deflections greater than the following:

1. Exterior Non-Load-Bearing, Curtain-Wall Framing: Horizontal deflection of 1/360 of the wall height.

1.3 SUBMITTALS

A. Product Data: Submit product data for each product indicated.

B. Shop Drawings: Submit shop drawings including layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.

1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Submit mill certificates.

D. Submit welder certificates.

E. Submit research/evaluation reports.

1.4 QUALITY ASSURANCE

A. Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing.

1. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.

B. Mill certificates signed by steel sheet producer.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

PART 2 - PRODUCTS

2.1 MATERIALS

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

B. Steel Sheet: ASTM A 653/A 653M, structural steel, G60 (Z180) zinc coating, Grade 33 (230) for minimum uncoated steel thickness of 0.0428 inch (1.09 mm) and less; Grade 50 (340) for minimum uncoated steel thickness of 0.0538 inch (1.37 mm) and greater.

C. Wall Framing: Manufacturer's standard steel studs, of web depths indicated, with stiffened flanges, complying with ASTM C 955, and as follows:

1. Minimum Uncoated-Steel Thickness: 0.0428 inch (1.09 mm).
2. Flange Width: 2 inches (51 mm).
3. Track: Manufacturer's standard U-shaped steel track, unpunched, with straight flanges, complying with ASTM C 955, manufacturer's standard flange width, and minimum uncoated-steel thickness matching steel studs.

2.2 ACCESSORIES AND MISCELLANEOUS MATERIALS

A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi (230 MPa), of manufacturer's standard thickness and configuration, unless otherwise indicated.

B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed, bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

D. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

E. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

F. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.

G. Galvanizing Repair Paint: ASTM A 780.

H. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

I. Thermal Insulation: Refer to Division 07 Section "Thermal Insulation."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to ASTM C 1007, manufacturer's written recommendations, and requirements in this Section.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
3. Install framing members in one-piece lengths.
4. Install temporary bracing and supports to secure framing and support loads comparable in magnitude to those for which structure was designed.
5. Install insulation in built-up exterior framing members, such as headers, sills, and multiple studs at openings, that are inaccessible on completion of framing work.
6. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

B. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

C. Non-Load-Bearing, Curtain-Wall Installation: Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure. Space studs as indicated; set plumb, align, and fasten both flanges of studs to track, unless otherwise indicated.

1. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
2. Install horizontal bridging in curtain-wall studs, spaced in rows indicated on Shop Drawings but not more than 54 inches (1370 mm) apart. Fasten at each stud intersection.
3. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

D. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 05 40 00

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes metal fabrications.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance:

1. Tube Framing for steel screen wall framing and Partial Height Walls: Provide tube framing for partial height walls capable of withstanding a deflection not to exceed 2L/1440 of the wall height when subjected to a positive and negative pressure of 5 psf.
2. Overhead Coiling Doors: Fabricate and install support framing capable of supporting all deadloads and withstanding live loads imposed from functioning operations.

B. Exterior Metal Fabrications: All exterior metal fabrications shall be fabricated and installed to prevent buckling, opening up of joints and overstressing of welds and fasteners under the following temperature conditions:

1. Base fabrication on a temperature of +70 deg F at time of installation with allowance made for an exposed metal surface temperature range of -5 deg F to +180 deg F. Make all necessary adjustments and provisions for concealed expansion.

1.3 SUBMITTALS

A. Product Data: Submit product data for the following:

1. Manufacturer’s data sheets for cage ladder.

B. Shop Drawings: Submit shop drawings detailing the fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1. For installed products indicated to comply with design loads, include structural analysis data, for information only, signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding Certificates: Copies of certificates for welding procedures and personnel.

D. 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.

1.4 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project for a minimum of 5 years, with a record of successful in-service performance, with sufficient production capacity to produce required units without causing delay in the work.

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

C. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.2, "Structural Welding Code--Aluminum."
3. AWS D1.3, "Structural Welding Code--Sheet Steel."
4. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.5 STORAGE, DELIVERY AND HANDLING

A. Store metal fabrications in a dry, well-ventilated, weathertight place. Deliver and handle so as to prevent any type of damage to the fabricated work.

1.6 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 FERROUS METALS

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

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

C. Cold Finished Steel Bars: ASTM A108, grade as selected by fabricator.

D. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500, or hot formed steel tubing complying with ASTM A 501.

E. Steel Pipe: ASTM A 53, standard weight (Schedule 40) minimum, unless otherwise indicated or required to satisfy the performance requirements; finish as follows:

1. Black finish, unless otherwise indicated.
2. Galvanized finish for exterior installations and where indicated.

F. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.3 ALUMINUM

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy 6063-T6.

B. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, alloy 6061-T6.

2.4 PAINT

A. Shop Primer for Ferrous Metal: Organic zinc-rich primer, complying with SSPC-Paint 20 and compatible with topcoat.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Carboline 621; Carboline Company.
b. Aquapon Zinc-Rich Primer 97-670; PPG Industries, Inc.
c. Tneme-Zinc 90-97; Tnemec Company, Inc.

B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 FASTENERS

A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36.

D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

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

F. Wood Screws: Flat head, carbon steel, ASME B18.6.1.

G. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).

H. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).

I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Interior Expansion Anchor Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Exterior Expansion Anchor Material: Alloy Group 1 or 2 stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

J. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.

2.6 GROUT

A. Non-shrink, Non-metallic Grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.7 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

1. Welded connections may be used where bolted connections are shown.

B. Shear and punch metals cleanly and accurately. Remove burrs.

C. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners and seams continuously along entire line of contact to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices and fasteners to secure metal fabrications rigidly in place and to support indicated loads.

F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

H. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

I. Remove sharp or rough areas on exposed traffic surfaces.

J. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous. Make up threaded connections tight so that threads are entirely concealed.

K. Hot-dip galvanize all exterior ferrous metal fabrications embedded in concrete. Hot-dip galvanize all other items where specified or shown.

1. Exterior ferrous metal fabrications are defined as those items which are indicated to be installed in areas exposed to conditions which are not controlled by the building heating and cooling systems.

2. Interior ferrous metal fabrications are defined as those items which are indicated to be installed in areas exposed to conditions which are controlled by the building heating and cooling systems.

2.8 ALUMINUM CAGE LADDER

A. General: Fabricate ladder safety cage to comply with ANSI A14.3.

B. Aluminum Cage Ladder with Roofover Rail Extension:

1. Model 532 as manufactured by O'Keeffe's Inc.
2. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.
3. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209
4. Finish: Mill finish
5. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18–3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
6. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.
7. Safety Cage: Fabricate ladder safety cages to comply with authority having jurisdiction. Assemble by welding. Spacing of primary hoops, secondary hoops and vertical bars shall not exceed that required by code.
8. Safety cage hoops and vertical bars: 3/16 inch (5 mm) by 2 inches (51 mm) aluminum bar.
9. Fasten assembled safety cage to ladder rails and adjacent construction by welding or riveting, unless otherwise indicated.

2.9 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports indicated and as necessary to complete the Work and which are not a part of the structural framework, including but not limited to framing and supports for overhead rolling doors and grilles, sliding doors, countertop and vanities, ceiling hung toilet compartments, ceiling hung televisions and cameras, [tube framing for partial height walls, and mechanical and electrical equipment.

B. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

C. Framing for Ceiling Hung Toilet Compartments: Provide framing for ceiling hung toilet compartments, coordinated with the partitions and including provisions for partition anchorage as required to sustain imposed loads and to limit deflections to L/360 between hangers, fabricated from the following.

1. Structural Steel Shapes, Plates and Bars: ASTM A36/A36M.
2. Modular Structural Framing System: Modular, structural quality steel pre-formed "U" channel framing system with continuous open slot prepared to receive attachment nuts, bolts, straps, threaded rods, beam clamps, hanger rods support brackets and other accessories. Provide manufacturer's standard corrosion resistant finish.

3. Provide steel rods, 1/2 inch diameter, spaced not more than 36 inches o.c. Thread rods to receive anchor and stop nuts. Fit hangers with wedge shape washers for full bearing on sloping flanges of support beam.
4. Coordinate installation with toilet compartment manufacturer's written instructions and recommendations.

D. Countertop and Vanity Framing: Custom fabricate countertop and vanity framing, using steel shapes and plates, and cold finished mild steel bars at exposed conditions, for support framing and plywood, to the thicknesses, sizes and shapes shown, and as required to produce work of adequate strength and durability, without objectionable deflections. Use proven details of fabrication, as required, to achieve proper assembly and alignment of the various components of the work.

E. Galvanize miscellaneous framing and supports at exterior locations; prime paint miscellaneous framing and supports at interior locations.

2.10 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from structural-steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches (150 mm) from each end, 6 inches (150 mm) from corners, and 24 inches (600 mm) o.c., unless otherwise indicated.

C. Galvanize exterior miscellaneous steel trim; prime paint interior miscellaneous steel trim.

2.11 PIPE BOLLARDS

A. Fabricate pipe bollards from Schedule 40 steel pipe.

B. Fabricate pipe bollards from Schedule 80 steel pipe.

1. Cap bollards with 1/4-inch- (6-mm-) minimum steel plate.

C. Fabricate bollards with 3/8-inch- (10-mm-) thick steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch (19-mm) anchor bolts.

D. Galvanize bollards after fabrication.

2.12 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.13 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces by removing oil, grease, and similar contaminants in accordance with SSPC -SP 1 "Solvent Cleaning," followed with the SSPC surface-preparation specifications listed below and environmental exposure conditions of installed metal fabrications. Surface preparation shall be done after fabrication and immediately prior to shop painting. Apply shop coat of paint within 4 hours after cleaning and before rust bloom occurs.

C. Apply a minimum of one coat of shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be field welded, and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Dry Film Thickness of Primer: 2.5 to 3.0 mils, dry film thickness. Apply paint thoroughly and evenly to dry surfaces, free from holidays and pinholes, in accordance with manufacturer's directions.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors. Drill holes for bolts to the exact diameter of the bolt. Provide screws threaded full length to the screw head.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

E. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

B. Ceiling Hung Toilet Partitions: Anchor supports securely to, and rigidly brace from, overhead building structure.

3.3 INSTALLING PIPE BOLLARDS

A. Anchor bollards to existing construction with post-installed anchors and bolts. Provide four 3/4-inch (19-mm) anchors at each bollard, unless otherwise indicated. Embed anchors at least 4 inches (100 mm) in existing concrete.

B. Fill bollards solidly with concrete, mounding top surface.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 Section "Painting."

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

END OF SECTION 05 50 00

SECTION 06 10 53 – MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Miscellaneous lumber.
2. Panel products for equipment backing panels.

B. See Division 06 Section "Sheathing" for exterior wall and parapet sheathing.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product indicated.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.

B. Research/Evaluation Reports: For the following:

1. Preservative-treated wood.
2. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the American Lumber Standards (ALSC) Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.
3. 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. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium..

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER

A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.

B. Other Framing: Construction or No. 2 grade and any of the following species:

1. Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; NLGA, WCLIB, or WWPA.
2. Southern pine; SPIB.

2.4 MISCELLANEOUS LUMBER

A. Provide miscellaneous lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.
4. Grounds.
5. Shims.
6. Post and joist framing for composite wood decking.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.5 INTERIOR WOOD TRIM

A. Lumber Trim for Opaque Finish (Painted): Finished lumber (S4S), either finger-jointed or solid lumber, of one of the following species and grades:

1. Grade Finish or 2 Common eastern white pine; NELMA or NLGA.
2. Grade 1 Common (Colonial) Idaho white, lodgepole, ponderosa, or sugar pine; NLGA or WWPA.
3. Grade A Finish alder, aspen, basswood, cottonwood, gum, magnolia, soft maple, sycamore, tupelo, or yellow poplar; NHLA.

2.6 PANEL PRODUCTS

A. Miscellaneous Exposed Plywood: DOC PS 1, A-D Interior, thickness as indicated but not less than 1/2 inch (13 mm).

B. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch (12.7 mm) thick.

2.7 FASTENERS

A. General: Where carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

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

C. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

C. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.

END OF SECTION 06 10 53

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Composite nail base insulated roof sheathing.
4. Subflooring.
5. Underlayment.
6. Sheathing joint and penetration treatment.

B. Related Requirements:

1. Division 06 Section "Miscellaneous Rough Carpentry" for plywood backing panels.
2. Division 07 Section "Self-Adhering Membrane Air Barrier" for water-resistive barrier applied over wall sheathing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For following products, from ICC-ES:

1. Preservative-treated plywood.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

A. Certified Wood: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Plywood.

B. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.

C. Thickness: As needed to comply with requirements specified.

D. Factory mark panels to indicate compliance with applicable standard.

2.2 WALL SHEATHING

A. Plywood Wall Sheathing: Exterior sheathing.

1. Span Rating: Not less than 20/0.
2. Nominal Thickness: Not less than1/2 inch (13 mm).

2.3 FASTENERS

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

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Power-Driven Fasteners: NES NER-272.

C. Wood Screws: ASME B18.6.1.

D. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall Sheathing:

a. Screw to cold-formed metal framing.

b. Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 06 16 00

SECTION 06 82 00 – GLASS FIBER REINFORCED PLASTIC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Special wall surfaces, including fiberglass reinforced plastic panels.

1.2 REFERENCES

A. ASTM International:

1. ASTM D2583 Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
2. ASTM D5420 Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide fiberglass reinforced plastic (FRP) panels that have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.4 SUBMITTALS

A. Product Data: Submit product data for specified products.

B. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures. Indicate location and dimension of joints and fastener attachment, locations and profiles of trim and moldings.

C. Samples: Submit selection and verification samples for finishes, colors and textures.

1. Submit two samples of each type of panel, trim and fastener.

a. Panel: 6 inches by 6 inches.
b. Molding: 6 inch length.

D. Quality Assurance Submittals: Submit the following:

1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

3. Manufacturer's Instructions: Manufacturer's installation instructions.
4. Manufacturer's Field Reports: Manufacturer's field reports specified herein.

E. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
2. Warranty: Warranty documents specified herein.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.
2. Manufacturer Qualifications: Manufacturer should be capable of providing field service representation during construction and should be capable of approving application method.

B. Fire-Retardant Panels: Comply with ASTM E 84; flame spread of 15 or less, smoke generated of 295 or less.

1.6 QUALITY CONTROL

A. Source Quality: Obtain fiberglass reinforced plastic (FRP) panels from a single manufacturer. Provide panels and molding only from manufacturer specified to ensure warranty and color harmonization of accessories.

1.7 DELIVERY, STORAGE & HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.

B. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels indoors in a dry place at the project site.

C. Handling: Remove foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.8 PROJECT CONDITIONS

A. Environmental Requirements:

1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from concrete work has dissipated.

2. During installation, and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
3. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings.

1.9 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1. Warranty Period: Two years commencing on Date of Substantial Completion.

1.10 MAINTENANCE

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.

1. Quantity: Furnish quantity of two units.
2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 - PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

A. General: Provide FRP panels with 100 percent recycled content and no added urea formaldehyde.

B. Manufacturer:

1. Marlite Corporation.

C. Product:

1. Marlite; Standard FRP.

a. Color: White.
b. 0.090 nominal thickness.
c. Textured finish.
d. Size: 4 feet by 8 feet.

D. Moldings: Provide harmonizing PVC (polyvinyl chloride) moldings.

1. Surface Protection: Provide manufacturer's proprietary surface protection for fiberglass reinforced plastic (FRP) panels.
2. Division Bars, Corner Trim: Panel manufacturer's standard length extruded vinyl pieces; longest length possible to eliminate end joints.
3. Fasteners: Noncorrosive drive rivets.

2.2 ACCESSORIES

A. Adhesive: Provide panel adhesive as recommended by panel manufacturer for high humidity conditions over a gypsum substrate and meeting the VOC content for construction adhesives.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

1. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk and joints and cracks are filled flush and smooth with the adjoining surface.
2. Do not begin installation until backup surfaces are in satisfactory condition.

3.3 PREPARATION

A. Surface Preparation: Provide clean, flat substrate for installers.

3.4 INSTALLATION

A. Fiberglass Reinforced Panel (FRP) Installation:

1. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.
2. Install panels with manufacturer's recommended gap for panel field and corner joints.
3. Cover all panel edges with trim. Panels shall be at least 6-inches wide.
4. Predrill fastener holes in panels with 1/8 inch (3.2 mm) oversize.

5. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.
6. Use products acceptable to panel manufacturer and install FRP system in accordance with panel manufacturer's printed instructions. Comply with panel manufacturer's Installation Guide.

3.5 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace products that have been installed and are damaged. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

1. Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

3.6 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION 06 82 00

SECTION 07 21 00 – THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Concealed building insulation.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Product test reports.

C. Research/evaluation reports.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

PART 2 - PRODUCTS

2.1 INSULATING MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standardsand, for preformed units, in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

B. Mineral-fiber blanket insulation consisting of fibers manufactured from glass:

1. Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.2 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

B. Asphalt Coating for Cellular Glass Block Insulation: Cutback asphalt or asphalt emulsion of type recommended by cellular glass block insulation manufacturer.

C. Protection Board: Premolded, semirigid asphalt/fiber composition board, 1/4 inch (6 mm) thick, formed under heat and pressure, of standard sizes.

D. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install insulation to comply with insulation manufacturer's written instructions applicable to products and application indicated. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

B. Installation of General Building Insulation: Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

1. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

    a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
    b. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

2. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm) support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

END OF SECTION 07 21 00

SECTION 07 27 27.13 – SELF-ADHERING WATER RESISTIVE AIR BARRIER MEMBRANE

PART 1 - GENERAL

1.1 SUMMARY

A. Supply labor, materials and equipment to complete the Work as shown on the Drawings and as specified herein to bridge and seal the following air leakage pathways and gaps:

1. Connections of the walls to the foundations.
2. Openings and penetrations of window and door frames, store front, curtain wall.
3. Piping, conduit, duct and similar penetrations.
4. Masonry ties, screws, bolts and similar penetrations.
5. All other air leakage pathways in the building envelope.

B. Materials and installation methods of the primary vapor permeable air barrier membrane system and accessories.

1.2 RELATED SECTIONS

A. Division 06 Section "Sheathing."

B. Division 07 Section "Thermal Insulation."

C. Division 07 Section "Thermoplastic Polyolefin (TPO) Membrane Roofing."

D. Division 07 Section "Joint Sealants."

E. Division 08 Section "Hollow Metal Doors and Frames."

1.3 REFERENCES

A. The following standards are applicable to this Section:

1. ASTM E 2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
2. ASTM E 2178: Standard Test Method for Air Permeance of Building Materials.
3. ASTM E 283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
4. ASTM E 96: Water Vapor Transmission of Materials.
5. ASTM C 920: Standard Specification for Elastomeric Joint Sealants.
6. ASTM C 1193: Standard Guide for Use of Joint Sealants.
7. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials.
8. ICC-ES AC-38: Acceptance Criteria for Water-Resistive Barriers.
9. ASTM E 2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.

10. AAMA 711-05: Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products.

B. AATCC – American Association of Textile Chemists and Colorists.

1. Test Method 127 Water Resistance: Hydrostatic Pressure Test.

C. TAPPI:

1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area).
2. Test Method T-460; Air Resistance (Gurley Hill Method).

1.4 SUBMITTALS

A. Submit documentation from an approved independent testing laboratory certifying compliance with a) the air leakage rates of the air barrier membrane assembly, including primary membrane, primer and sealants have been tested to meet ASTM E 2357, b) ICC-AC 38, c) Peel adhesion to unprimed plywood and cyclic and elongation per ICC-AC 48, d) Class A flame spread index and smoke development per ASTM E 84.

B. Submit documentation from an approved independent testing laboratory certifying the air leakage and vapor permeance rates of the air barrier membrane, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E 2178.

1. Test report submittals shall include test results of sustained wind loads and gust load air leakage results.

C. Submit manufacturers' current product data sheets for the air barrier membrane system.

1.5 QUALITY ASSURANCE

A. Submit document stating the applicator of the primary air barrier membranes specified in this section is authorized by the manufacturer as suitable for the execution of the Work.

B. Perform Work in accordance with manufacturer's written instructions and this specification.

C. Maintain one copy of manufacturer's written instructions on site.

D. Allow access to Work site by the air barrier membrane manufacturer's representatives.

E. Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, flashings and adhesives.

F. Single-Source Responsibility:

1. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
2. Provide products which comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.6 MOCK-UP

A. Where directed by Architect, construct typical exterior wall panel, approximately 6 foot long by 6 foot wide, incorporating substrate, storefront framing, and showing air barrier membrane application details.

B. Allow 48 hours for inspection of mock-up by Architect before proceeding with air barrier work. Mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Refer to current Product MSDS for proper storage and handling.

B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

C. Store roll materials on end in original packaging. Protect rolls from direct sunlight and weather until ready for use.

D. Store air barrier membranes, adhesives and primers at temperatures of 40 deg F and rising.

E. Keep solvent away from open flame or excessive heat.

F. Contractor to verify compliance for Volatile Organic Compounds (VOC) limitations of products to comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.8 COORDINATION

A. Ensure continuity of the water resistive air barrier throughout the scope of this section.

1.9 WARRANTY

A. Provide manufacturer's standard 12-year assembly warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Air barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

1. Acceptable Manufacturer:

Henry Company.
909 N Sepulveda Blvd, Suite 650
El Segundo, CA 90245

(800) 598-7663
Web Site: www.Henry.com

2.2 MEMBRANES (BASIS-OF-DESIGN)

A. Primary water resistive air barrier membrane shall be BlueskinVP™ 160 manufactured by Henry; a self-adhering reinforced modified polyolefin tri-laminate (Blue) sheet air barrier membrane for wall construction, specifically designed to be water resistant and vapor permeable. Patented adhesive backing to be protected with 3 piece release film. Membrane shall have the following physical properties:

1. Air leakage: <0.004 CFM/ft^2 at 1.57 lbs/ft^2 (<0.02L/s/m^2 at 75Pa) when tested in accordance with ASTM E 2178.
2. Water Vapor Permeance: 29 perms to ASTM E96, Method B.
3. Tested to ASTM E 2357 for Air Leakage of Air Barrier Assemblies.
4. Resistance to Water Penetration: Pass ICC-ES AC 38.
5. Water Penetration Resistance around Nails: Pass when tested to AAMA 711-05 and ASTM D 1970 modified.
6. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84: Flame Spread Rating of 0 and Smoke Development Classification of 105.
7. Basis Weight: Minimum 160 gm/m^2, when tested in accordance with TAPPI Test Method T-410.
8. Tensile Strength: 40 lbF MD and 29 lbF CD per ASTM D 828.
9. Average Dry Breaking Force: 127 lbF MD, and 91 lbF CD per ASTM D 5034.
10. Cyclic and Elongation: Pass at 100 cycles, -29 deg C (-20 deg F) per ICC-ES AC 48.

B. Self-adhering membrane for window sill pan flashings shall be Blueskin® SA or LT manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane which is integrally laminated to a blue polyethylene film. Membrane shall have the following physical properties:

1. Membrane Thickness: 0.040 inches (40 mils).
2. Low temperature flexibility: -30 deg F to ASTM D146.
3. Elongation: 200% minimum to ASTM D 412-modifed.
4. Minimum Puncture Resistance 40lbf to ASTM E 154.
5. Lap Peel Strength 10 lbf/in width to ASTM D 903 180° bend.
6. Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

C. Self-adhering membrane for all window jambs, headers, door openings, inside and outside corners, and other transitions shall be pre-cut BlueskinVP™ manufactured by Henry; a self-adhering reinforced modified polyolefin tri-laminate (White) sheet air barrier membrane for wall construction, specifically designed to be water resistant and vapor permeable. Membrane shall have the following physical properties:

1. Air leakage: <0.004 CFM/ft^2 at 1.57 lbs/ft^2 (<0.02L/s/m^2 at 75Pa) when tested in accordance with ASTM E 2178.
2. Water Vapor Permeance: 33 perms to ASTM E 96, Method B.
3. Resistance to Water Penetration: Pass ICC-ES AC 38.

4. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84: Flame Spread Rating of 5 and Smoke Development Classification of 125.
5. Basis Weight: Minimum 100 gm/m^2, when tested in accordance with TAPPI Test Method T-410.
6. Cyclic and Elongation: Pass at 100 cycles, -29 deg C (-20 deg F) per ICC-ES AC 48.
7. Average Dry Breaking Force: 127 lbF MD, and 91 lbF CD per ASTM D 5034.
8. Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

2.3 PRIMERS

A. Primer for primary self-adhering water resistive air barrier membrane, self-adhering transition membrane and SBS modified bitumen membranes at all temperatures shall be Blueskin® Spray-Prep manufactured by Henry, a synthetic rubber based adhesive aerosol, quick setting, having the following physical properties:

1. Color: clear to amber.
2. Solids by weight: 30%.
3. Maximum VOC 440 g/l.
4. Drying time (initial set): 10 minutes.
5. Service Temp: -40 deg F to 158 deg F.
6. Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

B. Primer for SBS modified bitumen self-adhering membranes at temperatures above 25 deg F shall be Aquatac™ Primer manufactured by Henry; a polymer emulsion based adhesive, quick setting. Primer shall have the following physical properties:

1. Colour: Aqua.
2. Weight: 8.7 lbs/gal.
3. Solids by weight: 53%.
4. Water based, no solvent odours.
5. Drying time (initial set): 30 minutes at 50% RH and 70 deg F.
6. Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

2.4 PENETRATION & TERMINATION SEALANT

A. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:

1. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A.
3. Complies with ASTM C 920, Type S, Grade NS, Class 25.
4. Elongation: 450 – 550%.
5. Remains flexible with aging.
6. Seals construction joints up to 1 inch wide.
7. Auxiliary tested component of ASTM E 2357 for Air Leakage of Air Barrier Assemblies.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the Work or any parts thereof shall mean acceptance of the prepared substrates.

B. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the membranes. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full-flush.

C. Curing compounds or release agents used in concrete construction must be resin based without oil, wax or pigments.

3.2 SURFACE PREPARATION

A. Surfaces must be sound, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane.

B. New concrete should be cured for a minimum of 14 days and must be dry before primer for air barrier membranes are applied.

C. Ensure all preparatory Work is complete prior to applying primary air barrier membrane.

D. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

E. Precast and concrete block substrates are required to be primed prior to application of self-adhering water resistive air barrier membrane.

3.3 APPLICATION OF SUBSTRATE PRIMER

A. Required Primer for SBS Modified Self-adhering Membranes.

1. For the application of SBS modified self-adhering window sill pan flashings, through-wall flashings and other applications of SBS modified self-adhering transition membranes, the substrate needs to be conditioned with applicable primer.
2. Apply primer at rate recommended by manufacturer to all areas to receive SBS modified self-adhering sheet membrane as indicated on drawings by roller or spray and allow to dry.
3. Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-primed.

B. Primer for Primary Water Resistive Air Barrier Membrane.

1. Clean, dry surfaces of most common construction materials including Dens-Glass Gold®, exterior grade gypsum board, primed steel, aluminum and galvanized metal do not require to be primed to achieve appropriate surface adhesion.
2. Where appropriate surface adhesion cannot be achieved, prime substrate with specified primer in an intermittent pattern, at a rate of 200-250 sq ft/gal as per Technical Data Sheet.
3. Precast concrete and concrete block substrates are required to be primed prior to application of self-adhering water resistive air barrier membrane.

3.4 INSTALLTION OF AIR BARRIER SYSTEM

A. Inside And Outside Corners:

1. Seal inside and outside corners of sheathing boards with a strip of self-adhering vapor permeable membrane extending a minimum of 3 inches on either side of the corner detail.

    a. For inside corners, pre-treat the corner with a continuous 1/2 inch bead of termination sealant.
    b. Prime surfaces in an intermittent pattern, at a rate of 200-250 sq ft/gal where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
    c. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
    d. Roll all laps and membrane with a counter top roller to ensure seal.

B. Transition Areas:

1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials as indicated in drawings with self-adhering water resistive air barrier transition membrane.

    a. Prime surfaces in an intermittent pattern, at a rate of 200-250 sq ft/gal where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
    b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 3 inch lap to all substrates.
    c. Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
    d. Roll all laps and membrane with a counter top roller to ensure seal.

C. Windows And Rough Openings:

1. Place specified SBS modified self-adhering window sill pan flashing membrane across window sills. Pre-treat inside corners with a bead of termination sealant. Install window sill pan membrane and end dam terminations, seal cuts and terminations with termination sealant.
2. Wrap jamb of rough openings with specified self-adhering water resistive air barrier transition membrane as detailed.

3. Extend specified self-adhering water resistive air barrier membrane into rough window openings sufficient to provide a connection to interior vapor retarder.

    a. Prime surfaces in an intermittent pattern, at a rate of 200-250 sq ft/gal where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
    b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
    c. Roll all laps and membrane with a counter top roller to ensure seal.

D. Primary Water Resistive Air Barrier:

1. Apply self-adhering water resistive air barrier membrane complete and continuous to substrate in a sequential overlapping weatherboard method starting at bottom or base of wall and working up in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

    a. Prime surfaces in an intermittent pattern, at a rate of 200-250 sq ft/gal where appropriate to achieve surface adhesion as per manufacturers' instructions and allow to dry.
    b. Cut to manageable sections, align and position self-adhering membrane to substrate, remove top panel of protective release film and press firmly into place.
    c. Ensure alignment, hold membrane in place to avoid wrinkles and sequentially remove remaining panels of protective film and press firmly into place.
    d. Ensure minimum 3 inch overlap at all ends and 2 inch side laps of subsequent membrane applications.
    e. Pressure roll all membrane surfaces, laps and flashings with a counter top roller or 'J-roller' to ensure appropriate surface adhesion.
    f. At the end of each day's work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel apply a feathered edge to seal termination and shed water.

3.5 APPLICATION OF TERMINATION SEALANT

A. Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the primary water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with specified termination sealant.

3.6 FIELD QUALITY CONTROL

A. Make notification when sections of Work are complete to allow review prior to covering air barrier system.

3.7 PROTECTION

A. Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.

B. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed air barrier installations.

C. Water resistive air barrier membrane is not designed for permanent exposure. Good practice calls for covering as soon as possible, not to exceed 90 days.

D. Regional weather conditions and daytime sunlight temperatures may require the membrane to be protected under the 90 day exposure limit.

END OF SECTION 07 27 27.13

SECTION 07 46 00 - SIDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiber-cement siding, moulding and accessories.

B. Related Sections:

1. Division 06 Section "Miscellaneous Rough Carpentry" for wood furring, grounds, nailers, and blocking.

2. Division 06 Section “Sheathing” for plywood sheathing.
3. Division 07 Section "Self-Adhering Water Resistive Air Barrier Membrane" for weather-resistive barrier.
4. Division 09 Section “Exterior Painting” for field painting of fiber-cement siding.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: For siding, including related accessories.

C. Samples for Verification: For each type, color, texture, and pattern required.

1. 12-inch- long-by-actual-width Sample of siding.
2. 12-inch- long-by-actual-width Samples of trim and accessories.

D. Product Certificates: For each type of siding, from manufacturer.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.

F. Research/Evaluation Reports: For each type of siding required, from the ICC.

G. Maintenance Data: For each type of siding, soffit and related accessories to include in maintenance manuals.

H. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

B. Source Limitations: Obtain each type, color, texture, and pattern of siding and soffit, including related accessories, from single source from single manufacturer.

C. Installer Qualifications: Minimum of 2 years of experience with installation of similar products.

D. Preinstallation Conference: Conduct conference at Project site with manufacturer's representative.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer's recommended limits.

1.6 COORDINATION

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

1.7 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace siding that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including cracking and deforming.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING

A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84. Code Compliance Requirements for materials: National Evaluation Report No. NER 405.

1. Product: James Hardie Commercial; Artisan Lap.
2. Type: Tongue and groove ends with vertical lap, 8-1/4 inches with 7 inches of exposure.
3. Thickness: 5/8 inch.
4. Panel Texture: Smooth.
5. Factory Priming: Manufacturer's standard acrylic primer.

2.2 ACCESSORIES

A. Flashing:

1. Provide stainless-steel flashing complying with Division 07 Section "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
2. Provide stainless steel corner flashing under siding at all outside corners, per manufacturer's recommended details.
3. Provide J-trim at top of wall termination; equal to JMHD by Tamlyn.
4. Provide lap starter strip at bottom course of siding; equal to VCSS Heavy-Duty by Tamlyn.
5. Custom trim shape for window jamb closure at siding; by Tamlyn or equal.

    a. Size and shape as indicated on Drawings.

B. Fasteners:

1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch, or three screw-threads, into substrate.
2. For fastening fiber cement, use series 300 stainless-steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent code requirements apply.

1. Do not install damaged components.

B. Install fiber-cement siding and related accessories.

1. Lap siding a minimum of 1-1/4 inches.
2. Treat end joints as indicated on the Drawings, or if not indicated as required by the AHJ.
3. Miter all outside corners.

C. Wind Resistance: Where a specified level of wind resistance is indicated on the Drawings, install siding to framing members and secure with fasteners described in Table No. 2 in the National Evaluation Service Report No. NER-405.

D. Install joint sealants as specified in Division 07 Section "Joint Sealants" and to produce a weathertight installation.

3.4 PROTECTION

A. Protect installed products until completion of project.

3.5 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 07 46 00

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes sealants for the following applications:

1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:

a. Control and expansion joints in unit masonry.
b. Joints between metal panels.
c. Joints between different materials listed above.
d. Perimeter joints between materials listed above and frames of doors and windows and louvers.
e. Other joints as indicated.

2. Exterior joints in the following horizontal traffic surfaces:
a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
b. Tile control and expansion joints.
c. Joints between different materials listed above.
d. Other joints as indicated.

3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
a. Perimeter joints of exterior openings where indicated.
b. Tile control and expansion joints.
c. Perimeter joints between interior wall surfaces and frames of interior doors, and windows.
d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
e. Other joints as indicated.

B. Single Subcontract Responsibilities: Refer to Division 08 Section "Aluminum-Framed Entrances and Storefronts," for requirements applicable to single subcontract responsibility.

1.2 SUBMITTALS

A. Product Data: Submit product data for each joint-sealant product indicated and the following:

1. Written certification from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use(s) indicated as verified through manufacturer's in-house testing laboratory.

a. Test results for all job specific concealed and exposed sealants confirming compatibility and adhesion are mandatory for all materials in contact with exterior aluminum glazing system, prior to erection of sample installations.
b. Complete instructions for handling, storage, mixing, priming, installation, curing and protection of each type of sealant.

2. Laboratory and field test results confirming joint preparation (cleaning/priming), chemical compatibility, and proper adhesion for specified joint sealant for each of the joint profiles and substrate materials included in the design of this project.

B. Warranties: Submit specified warranties.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Exposed sealant work including, but not limited to, sealants used for air and weatherseals which are external to aluminum storefront systems at their perimeter, and skylights, shall be performed by one firm specializing in the installation of sealants who has successfully produced work comparable to this project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 10 years. Concealed sealant work (sealants which are internal to aluminum storefront systems at their perimeter, and skylights, necessary for air and moisture penetration resistance under applied loads) shall be the responsibility of the subcontractor responsible for the final design, installation, and performance of the respective system.

B. Source Limitations: Obtain each type of joint sealant, and each type of structural silicone adhesive, from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing (All Exterior Wall Sealants Only): Submit to joint sealant manufacturers, prior to full size building sample installation(s), samples of materials that will contact or affect, by direct or indirect chemical or mechanical means, exterior wall joint sealants for compatibility and adhesion testing below.

1. General: Test results confirming compatibility and adhesion are mandatory for all concealed and exposed sealant materials in contact with exterior glazing, exterior siding, other sealants, flashings, metal framing, and shims, prior to the construction of full sized sample installation(s).

a. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the work.
b. Investigate materials that fail compatibility and adhesion testing and obtain sealant manufacturer's written recommendations for corrective measures, which may include the use of primers, cleaners, cleaning measures, curing time, temperature limitations (surface and air), humidity conditions, moisture content of substrate, etc.
c. Definitions:

1) Compatibility: The capability of the sealant materials and substrates to be placed in direct contact with each other and maintain their required physical, chemical and visual qualities with the absence of softening, staining, oil exudation, discoloration or other detrimental, deleterious or degradative effects caused by chemical interactions.
2) Adhesion: The mechanical or chemical ability of the sealant materials and substrates to adhere or bond together at their interface.

d. Specimen Sizes and Shapes: As required by the manufacturer's testing laboratory for the tests listed, unless otherwise specified.

2. Tests Required:

a. Adhesion in Peel Testing:

1) Test Methods:

a) Comply with ASTM C794 'Adhesion and Peel of Elastomeric Joint Sealants', modified to include project specific substrates and to report cohesive or adhesive failure mode. Samples of each exterior siding,]other sealants, flashings, metal framing in contact with the concealed and exposed sealant materials are required to be tested.
b) conditioning required of ASTM C1135; the Contractor shall prepare, and test, additional specimens for each project specific environmental condition under which the sealant will be applied and cured.

2) All specimens shall be tested for primed and unprimed performance.
3) Report:

a) Date(s) of testing.
b) Project identification.
c) Test method (as identified herein).
d) Specimen substrate(s) tested.
e) Sealant(s) tested.
f) Substrate preparation (cleaning materials, methods and primers used).
g) Test results for each specimen tested (type of failure - adhesive or cohesive - force measured at failure in pounds per lineal inch).
h) Recommendations. Where testing shows equal or better performance without a primer, a primer will not be required.
i) Additional remarks, if any (i.e., color change of substrate or sealant, voids in the body of the sealant when examined in cross section, blistering, bubbling, sealant softening, or evidence of improperly mixed or cured sealant).

b. Preconstruction Field-Adhesion Testing: Before installing exposed exterior elastomeric sealants, field test their adhesion to joint substrates as follows:

1) Locate test joints where indicated or, if not indicated, as directed by Architect.
2) Conduct field tests for each type of exposed exterior elastomeric sealant and joint substrate indicated.
3) The Architect and manufacturer's technical representative, shall be present when joints are tested.
4) Test Method: Test exterior elastomeric joint sealants by hand-pull method described below:

a) Install joint sealants in 60-inch (1500-mm-) long joints using same materials and methods for joint preparation and joint-sealant

installation in accordance with manufacturer's final laboratory testing recommendations. Allow sealants to cure.

b) Make knife cuts from one side of joint to the other, followed by two cuts approximately 3-inch (75 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1-inch (25 mm) from cross-cut end of 3-inch (75-mm) piece.

c) Use fingers to grasp 3-inch (75-mm) piece of sealant between cross-cut end and 1-inch (25-mm) mark; pull firmly down at a 90-degree angle to the joint and hold sealant in this position for ten seconds; following the ten second time duration pull sealant at a 180 degree angle parallel to the joint and hold the sealant in this position for ten seconds. Pull sealant away from joint to the distance recommended by sealant manufacturer for testing adhesion.

d) Repair joint as recommended by the sealant manufacturer.

5) Sealants evidencing adhesive failure with one or both substrates during testing, and/or a level of elongation prior to failure that is not in compliance with the performance characteristics specified herein or otherwise published by the sealant manufacturer will be subject to rejection by the Architect. Discontinue use of joint sealants, cleaning agents, primers, and application methods associated with failures documented during testing and immediately notify manufacturer and Architect for further review.

3. Report: Provide written summary of each compatibility and adhesion test.

D. Sample Installation: Provide mock-ups and sample installation of sealants at locations indicated or required by the Architect. Mock-ups and sample installations shall represent the primary types of materials, substrate surfaces, joint size, exposure, and other conditions to be encountered in the work. Preparation, priming, application, and curing, shall comply with manufacturer's recommendations and actual proposed methods. Schedule the applications, with allowance for sufficient curing time, so that samples may be examined and necessary adjustments made at least 1 week prior to date scheduled for commencing installation of the work.

1. The sample installation shall be visually examined for staining, dirt pickup, shrinkage, color, general workmanship and appearance. Cut and pull the sealant from each sample joint to examine for internal bubbles or voids, adhesion, and general compatibility with substrate.
2. Sample installations are required in conjunction with the following:

a. Division 07 Section "Siding."
b. Division 08 Section "Aluminum-Framed Entrances and Storefront."

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
2. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealant work which has failed to provide a weathertight system within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special Manufacturer's Warranties: Written warranties (weatherseal and stain resistance), signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that fail to provide airtight and watertight joints, or fail in adhesion, cohesion, abrasion-resistance, stain-resistance, weather resistance, or general durability or appear to deteriorate in any other manner not clearly specified in the manufacturer's data as an inherent quality of the material within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as stated by sealant manufacturer's published data, and as substantiated by the manufacturer for each application through testing.

B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: Not more than 250 g/L.
2. Nonmembrane Roof Sealants: 300 g/L.
3. Single-Ply Roof Membrane Sealants: 450 g/L.
4. Sealant Primers for Nonporous Substrates: Not more than 250 g/L.
5. Sealant Primers for Porous Substrates: Not more than 775 g/L.

C. Colors: For fully concealed joints, provide manufacturer's standard color of sealant which has the best overall performance characteristics for the application shown. For exposed joints provide custom colors to match Architect's samples of the following:

1. Exterior window and curtain wall framing, each color.
2. Exterior field applied paints and coatings, each color.
3. Other exterior and interior materials, each color as indicated.

D. Manufacturer's Representative: Do not use elastomeric sealant produced by a manufacturer who will not agree to send a qualified technical representative to the project site when requested, for the purpose of rendering advice concerning the proper installation of manufacturer's materials.

2.2 ELASTOMERIC JOINT SEALANTS

A. Silicone Sealants for Vertical Applications (Non-Sag):

1. Typical Exterior Wall Joints:

a. Properties:

1) Standards: Comply with ASTM C920, Type M or S, Grade NS, Class 25 or 50; use NT, M, A and O.
2) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum peel adhesion value after 7 day immersion shall not be less than 13 pli (2.27 kN/m) when tested in strict accordance with ASTM C794 Adhesion in Peel.
3) Cure System and Oil Content: Neutral-cure, low or medium modulus system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.

b. Products and Manufacturers: One of the following:

1) 756 SMS; Dow Corning.
2) Spectrem 3 or Spectrem 4-TS (Use Spectrem 1 for metal to metal joints); Tremco, an RPM Co.
3) Silpruf NB SCS 9000 (use Silpruf SCS 2000 for metal to metal joints); GE Advanced Materials – Silicones.

B. Two Part Polyurethane Sealants for Vertical Applications (Non-Sag):

1. Typical Exterior Wall Joints (Two-part Polyurethane Sealants):

a. Properties:

1) Standards: Comply with ASTM C920, Type M, Grade NS, Class 25 or Class 50; use NT, M, A and O.
2) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum peel adhesion value after 7 day immersion shall not be less than 13 pli (2.27 kN/m) when tested in strict accordance with ASTM C794 Adhesion in Peel.

b. Products and Manufacturers: One of the following:

1) Pecora Corporation; Dynatrol II.
2) BASF; Sonneborn Systems, Sonolastic NP-2 ™.
3) Tremco, an RPM Co.; Dymeric 240.

C. Two-Part Polyurethane Sealant for Paving Applications:

1. For Paving Applications with Slopes not Exceeding 5% (Self Leveling): ASTM C920, Type M, Grade P, Class 25; use T and I; with high durometer hardness and abrasion resistance, and rated for water immersion; one of the following:

a. Pecora Corporation; Urexpan NR-200.
b. BASF; Sonneborn Systems, Sonolastic SL 2 ™.
c. Tremco, an RPM Co.; THC 900.

2. For Paving Applications with Slopes Exceeding 5%: ASTM C920, Type M, Grade P "Slope Grade," Class 25; uses T and I; with high durometer hardness and abrasion resistance, and rated for water immersion; one of the following:

a. Pecora Corporation; Dynatred.
b. BASF; Sonneborn Systems, Sonolastic SL 2 ™.
c. Tremco, an RPM Co.; THC-901.

D. Sealants for Contact with Food: Comply with 21 CFR 177.2600, NSF Standard 51, and ASTM C920 for Type S, Grade NS, Class 25, Use NT.

1. Dow Corning; 786 Mildew Resistant Silicone Sealant.

E. Mildew-Resistant Silicone Sealant (use for joints at toilet fixtures, toilet room countertops and vanities, and at janitor closet mop receptor to wall transition): Complying with ASTM C920, Type S (single component), Grade NS (non-sag), class 25, Use NT (non-traffic), Substrate uses G, A, and O; and containing a fungicide for mildew resistance; white color.

1. Products: Provide one of the following:

a. Dow Corning; 786 Mildew Resistant Silicone Sealant.
b. GE Advanced Materials - Silicones; Sanitary SCS 1700.

c. Pecora Corporation; 898 Silicone Sanitary Sealant.
d. Tremco, an RPM Co.; Tremsil 200 Sanitary.

2.3 LATEX JOINT SEALANTS

A. Latex Sealant: Non-elastomeric, one part, non-sag, paintable latex sealant that is recommended for exposed applications on the interior. Complying with ASTM C 834, Type OP (opaque sealants):

1. Products: Provide one of the following:

a. Pecora Corporation; AC-20 + Silicone
b. BASF; Sonneborn Systems, Sonolastic Sonolac.
c. Tremco, an RPM Co.; Tremflex 834.

2.4 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. Cylindrical Sealant Backings: One of the following preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding backings of flexible plastic foam complying with ASTM C 1330, and of type indicated below. Select shape and density of cylindrical sealant backings in consultation with the manufacturer for proper performance in specific condition of use in each case.

1. Type C: Closed-cell polyethylene foam material with a surface skin, which is nonabsorbent to liquid water and gas, non-outgassing in unruptured state; one of the following:

a. HBR Closed Cell Backer Rod; Nomaco, Inc.
b. Sonneborn Closed-Cell Backer-Rod; BASF.

2. Type B: Bi-cellular reticulated, polymeric foam material with a surface skin, nonoutgassing, with a density of between 1.5-3.0 pcf (24-48 kg/cubic meter) per ASTM D1622 and minimum tensile strength of greater than 29 – 38 psi (200 – 267 kPa) per ASTM D1623, and with water absorption less than 0.058 oz./cubic inch (0.10 gm/cc) per ASTM C1016; one of the following:

a. SOFROD; Nomaco, Inc.
b. Sonneborn Sonolastic Soft Backer-Rod; BASF.

C. Bond-Breaker Tape: Polyethylene, TFE fluorocarbon, or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

D. Weep and Vent Tubes: Clear plastic (PVC) tubing, minimum 1/4 inch (6.35 mm) inside diameter, and of length as required to extend between exterior face of sealant and open cavity behind.

1. At window and curtain wall systems, where required by system designer, provide gutter termination of tube with preformed nipples suitable for sealing to gutter.

E. Cork Joint Filler: Resilient and nonextruding, ASTM D1752, Type II.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended, as verified through compatibility and adhesion testing, by joint sealant manufacturer for the substrates indicated to be sealed.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and which will not stain nor mar the finish of surfaces adjacent to joints to which it is applied.

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. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove 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), existing joint sealants, existing backer rods, existing waterproofing materials, existing water repellent treatments, oil, grease, water, surface dirt, and frost.
2. Clean concrete, masonry, unglazed surfaces of 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 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 (Elastomeric Sealants Only): Prime joint substrates where recommended in writing by joint sealant manufacturer, based on prior testing and experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration beyond bond areas or onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant and primer smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

1. Silicone Glazing Sealants: Refer to Division 08 Section "Glazing" for installation.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

    a. Do not leave gaps between ends of sealant backings. Trim for tight fit around obstructions or elements penetrating the joint.
    b. Do not stretch, twist, puncture, or tear sealant backings.
    c. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry sealant backings.

2. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
3. Install weeps and vents into joints at the same time sealants are being installed. Unless otherwise shown on the drawings, or directed by the Architect, locate weeps and vents spaced as recommended by the sealant manufacturer and the window and curtain wall fabricator and erector. Do not install weeps and vents at outside building corners. Do not install vents at horizontal joints immediately below shelf angles, sills, and through wall flashings.

D. 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.

1. Apply sealants in the depth shown or, if none is shown, apply in accordance with the manufacturer's recommendations and the following general proportions and limitations:

    a. Apply elastomeric sealants in sidewalk, pavement and similar horizontal joints to a depth equal to 75% of the joint width, but not less than 3/8 inch (10 mm) and not more than 3/4 inch (19 mm).
    b. Apply elastomeric sealants, in joints not subject to traffic or other abrasion, to a depth equal to 50% of the joint width, but not less than 1/4 inch (6 mm) and not more than 1/2 inch (13 mm).
    c. Apply non-elastomeric sealants to a depth approximately equal to the joint width.
    d. Fill horizontal traffic bearing joints slightly recessed to avoid direct contact with wheel, and pedestrian traffic. Fill horizontal traffic bearing joints with slope grade polyurethane sealants to a depth approximately equal to the joint width.

2. Pour self leveling sealants to a depth approximately equal to the joint width.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform, beads 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. Tool exposed surfaces of sealants to the profile shown, or if none is shown, tool slightly concave.

1. Use masking tape to protect adjacent surfaces of recessed tooled joints.
2. Provide a slight wash on horizontal joints where horizontal and vertical surfaces meet.
3. Against rough surfaces or in joints of uneven widths avoid the appearance of excess sealant or compound by locating the compound or sealant well back into joint wherever possible.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field-test exterior wall joint-sealant adhesion to joint substrates as follows:

1. Perform 3 tests for the first 200 feet of joint length for each type of exposed exterior wall sealant and joint substrate.

B. Field adhesion testing of sealants shall take place in the presence of a qualified technical representative of the sealant manufacturer.

1. Test Method: Test joint sealants by hand-pull method described below:

    a. Make knife cuts from one side of joint to the other, followed by two cuts approximately 3 inches (75 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1 inch (25 mm) from cross-cut end of 3-inch (75-mm) piece.
    b. Use fingers to grasp 3-inch (75-mm) piece of sealant between cross-cut end and 1-inch (25-mm) mark; pull firmly at a 90-degree angle to the joint in the direction of

side cuts and hold the sealant in this position for 10 seconds; following the 10 second time duration pull sealant at a 180 degree angle parallel to the joint and hold the sealant in this position for 10 seconds. Pull sealant away from joint to the distance recommended by sealant manufacturer for testing adhesion.

c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.

2. The sealant manufacturer's qualified technical representative shall record test results, and observations of joint and sealant conditions, in a field adhesion test log.
3. Repair joint sealants pulled from test area as recommended by sealant manufacturer.
4. The sealant manufacturer shall provide written documentation of changes in product and/or application method required to address sealant failure, observe and document retesting as required by the Architect, and provide a written statement of compliance with applicable warranties.

C. Sealants not evidencing adhesive failure from testing will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 07 92 00

SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes steel doors and frames.

1. The integration of a security system into the steel door and frame work is required. The Contractor shall be responsible for the total and complete coordination of the security system components into the Work.

1.2 SUBMITTALS

A. Product Data: Submit product data for each product indicated. Include material descriptions, core descriptions, label compliance, sound and fire-resistance ratings, and finishes for each type of door and frame specified.

B. Shop Drawings: Submit door and frame schedule using same reference designations indicated on Drawings. Include opening size(s), handing of doors, frame throat dimensions, details of each frame type, elevations of door design types, details of construction, location and installation requirements of door hardware and reinforcements, hardware group numbers, details of joints and connections, fire label requirements including fire rating time duration, maximum temperature rise requirements, and smoke label requirements.

1. Indicate routing of electrical conduit and dimensions and locations of cutouts in doors and frames to accept electric hardware devices.

C. Certificate of Compliance for Fire Rated Doors: Provide copies of Certificate of Compliance for all fire rated door assemblies, all smoke and draft control door assemblies, and all temperature rise rated door assemblies.

1.3 QUALITY ASSURANCE

A. Steel Door and Frame Standard: Comply with the applicable provisions and recommendations of the following publications by Hollow Metal Manufacturers Association (HMMA) Div. of National Association of Architectural Metal Manufacturers (NAAMM), unless more stringent requirements are indicated in the Contract Documents:

1. HMMA "Hollow Metal Manual."
2. HMMA 861 "Guide Specifications for Commercial Hollow Metal Doors and Frames."

B. Manufacturer Qualifications: A firm experienced in manufacturing steel doors and frames similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames palleted, wrapped, or crated to provide protection during transit and Project site storage.

B. Inspect doors and frames, on delivery, for damage. Tool marks, rust, blemishes, and any other damage on exposed surfaces will not be acceptable. Remove and replace damaged items as directed by Architect. Store doors and frames at building site in a dry location, off the ground, and in such a manner as to prevent deterioration.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide doors and frames by one of the following:

1. Steel Doors and Frames:

a. Ceco Door Products.
b. Curries Company.
c. Steelcraft; a division of Ingersoll-Rand.

2.2 MATERIALS

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 20 percent.

B. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, CS (commercial steel), Type B; free of scale, pitting, or surface defects; pickled and oiled. Not less than 0.053 inch (1.3 mm) thick where frames are indicated to be built into exterior walls, hot dip galvanize after fabrication in compliance with ASTM A153/A153M, Class B.

C. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, CS (commercial steel), and ASTM A 568/A 568M, free from scale, pitting, coil breaks, or other defects, exposed (matte) dull finish.

D. Metallic-Coated Steel Sheets: ASTM A924/A924M and ASTM A 653/A 653M, CS (commercial steel), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating, mill phosphatized.

E. Inserts, Bolts, and Fasteners: Galvanized or cadmium plated steel.

1. Expansion Bolts and Shields: FS FF-S-325, Group III, Type 1 or 2.
2. Machine Screws: FS FF-S-92, carbon steel, Type III cross recessed, design I or II recess, style 2C flat head.

F. Filler: Sound deadening and heat retarding mineral fiber insulating material.

G. Glass and Glazing: Refer to Division 08 Section "Glazing."

2.3 DOORS

A. General: Provide flush-design doors, 1-3/4 inches (44 mm) thick, of seamless hollow construction, unless otherwise indicated. Construct doors with sheets joined at their vertical edges by continuous welding the full height of the door, with no visible seams on their faces or vertical edges, and all welds ground and finished flush.

1. Visible joints or seams around glazed inserts are permitted.
2. For single-acting swing doors, bevel both vertical edges 1/8 inch in 2 inches (3 mm in 50 mm).

B. Core Construction: Provide one of the following core constructions welded to both door faces:

1. Steel-Stiffened Core: 0.032-inch (0.8-mm) steel vertical stiffeners extending full-door height, spaced not more than 6 inches (150 mm) apart and spot welded to face sheets a maximum of 5 inches (127 mm) o.c. Place filler between stiffeners for full height of door.
2. Continuous Truss-Form Inner Core: 0.013-inch- (0.33-mm-) thick steel reinforcement spot welded to face sheets a maximum of 2-3/4 inches (69.9 mm) o.c. vertically and horizontally.

C. Top and Bottom Channels: Spot weld metal channel not less than thickness of face sheet to face sheets not more than 6 inches (150 mm) o.c.

1. Reinforce tops and bottoms of doors with inverted horizontal channels of same material as face sheet so flanges of channels are even with bottom and top edges of face sheets.
2. For exterior doors, close bottom edge with metallic-coated steel closing channel and top edge with filler channel of same material, so webs of channels are flush with bottom and top door edges. Weld inverted steel channels to both face sheets or form integrally with edge construction of door.

D. Hardware Reinforcement: Fabricate reinforcing from the same material as door to comply with the following. Offset reinforcement so that faces of mortised hardware items are flush with door surfaces.

1. Hinges and Pivots: 0.167 inch (4.2 mm) thick by 1-1/2 inches (38 mm) wide by 9 inches (229 mm).
2. Lock Front, Strike, and Flushbolt Reinforcements: 0.093 inch (2.3 mm) thick by size as required by hardware manufacturer.
3. Lock Reinforcement Units: 0.067 inch (1.7 mm) thick by size as required by hardware manufacturer.
4. Closer Reinforcements: 0.093 inch (2.3 mm) thick one-piece channel by size as required by hardware manufacturer.
5. Other Hardware Reinforcements: As required for adequate strength and anchorage.
6. In lieu of reinforcement specified, hardware manufacturer's recommended reinforcing units may be used.

7. Exit Device Reinforcements: 0.250 inch (6.35 mm) thick by 10 inches (245 mm) high by 4 inches (101 mm) wide centered on exit device case body, unless otherwise recommended by exit device manufacturer.

E. Electrical Requirements: Make provisions for installation of electrical items specified elsewhere; arrange so wiring can be readily removed and replaced.

1. Provide all cutouts and reinforcements required for steel doors to accept security system components.
2. Doors with Electric Hinges and Pivots: Provide with metal conduit or raceway to permit wiring from electric hinge or pivot to other electric door hardware.

a. Hinge Location: Center for doors less than 90 inches (2286 mm) tall or second hinge from door bottom for doors greater than 90 inches (2286 mm); top or bottom electric hinge locations shall not be permitted.

F. Interior Steel Doors:

1. Typical Interior Doors: Flush design with 0.042-inch- (1.06-mm-) thick cold-rolled stretcher-leveled steel face sheets and other metal components from hot- or cold-rolled steel sheets.

G. Exterior Steel Doors: Flush design with 0.053-inch- (1.3-mm-) thick metallic-coated stretcher leveled steel face sheets and other metal components from metallic coated steel sheets. Provide weep-hole openings in bottom of doors to permit entrapped moisture to escape.

2.4 PANELS

A. Provide panels of same materials, construction, and finish as specified for doors.

2.5 FRAMES

A. Fabricate steel door frames, formed to profiles indicated, with full 5/8 inch (16 mm) stops, and of the following minimum thicknesses.

1. For exterior use, form frames from 0.067-inch- (1.7-mm-) thick, metallic-coated steel sheets.
2. For interior use, form frames from cold- rolled steel sheet of the following thicknesses:

a. Openings up to and Including 48 Inches (1200 mm) Wide: 0.053 inch (1.3 mm).
b. Openings More Than 48 Inches (1200 mm) Wide: 0.067 inch (1.7 mm).

B. Provide frames either saw mitered and full (continuously) welded, or machine mitered and full welded, on back side at frame corners and stops with edges straight and true. Grind welds smooth and flush on exposed surfaces.

C. Hardware Reinforcement: Fabricate reinforcements from same material as frame to comply with the following. Offset reinforcement so that faces of mortised hardware items are flush with surface of the frame.

1. Hinges and Pivots: 0.167 inch (4.2 mm) thick by 1-1/4 inches (32 mm) wide by 10 inches (254 mm).
2. Strike, Surface Mounted Hold Open Arms, and Flushbolt Reinforcements: 0.093 inch (2.3 mm) thick by size as required by hardware manufacturer.
3. Closer Reinforcements: 0.093 inch (2.3 mm) thick one piece channel by size as required by hardware manufacturer.
4. Other Hardware Reinforcements: As required for adequate strength and anchorage.

D. Electrical Requirements: Make provisions for installation of electrical items specified elsewhere; arrange so wiring can be readily removed and replaced.

1. Provide all cutouts and reinforcements required for steel frames to accept security system components.
2. Frames with Electric Hinges and Pivots: Provide welded on UL listed back boxes with metal conduit or raceway to permit wiring from electric hinge or pivot to other electric door hardware.

    a. Hinge Location: Center for doors less than 90 inches (2286 mm) tall or second hinge from door bottom for doors greater than 90 inches (2286 mm); top or bottom electric hinge locations shall not be permitted.

E. Jamb Anchors: Locate jamb anchors above hinges and directly opposite on strike jamb as required to secure frames to adjacent construction. At metal stud partitions locate the additional jamb anchor below the top hinge.

1. Metal-Stud Partitions: Metal channel stud zee anchor sized to match stud width, welded to back of frames, formed of same material and gauge thickness as frame. Provide at least the number of anchors for each jamb according to the following heights:

    a. Three anchors per jamb up to 60 inches (1500 mm) in height.
    b. Four anchors per jamb from 60 to 90 inches (1500 to 2250 mm) in height.
    c. Five anchors per jamb from 90 to 96 inches (2250 to 2400 mm) in height.
    d. One additional anchor per jamb for each 24 inches (600 mm) or fraction thereof more than 96 inches (2400 mm) in height.

F. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, formed of same material as frame, 0.093 inch (2.3 mm) thick, and punched with two holes to receive two (2) 0.375 inch (9.5 mm) fasteners. Where floor fill or setting beds occur support frame by adjustable floor anchors bolted to the structural substrate. Terminate bottom of frames at finish floor surface.

G. Head Strut Supports: Provide 3/8-by-2-inch (9-by-50-mm) vertical steel struts extending from top of frame at each jamb to supporting construction above. Bend top of struts to provide flush contact for securing to supporting construction above by bolting, welding, or other suitable anchorage. Provide adjustable wedged or bolted anchorage to frame jamb members to permit height adjustment during installation. Adapt jamb anchors at struts to permit adjustment.

H. Head Reinforcement: For frames more than 48 inches (1200 mm) wide in masonry wall openings, provide continuous steel channel or angle stiffener, 0.093 inch (2.3 mm) thick for full width of opening, welded to back of frame at head. Head reinforcements shall not be used as a lintel or load-bearing member for masonry.

I. Spreader Bars: Provide removable spreader bar across bottom of frames, tack welded to jambs and mullions to serve as bracing during shipment and handling and to hold frames in proper position until anchorage and adjacent construction have been completed.

J. Door Silencer Holes: Drill strike jamb stop to receive three silencers on single door frames and for two silencers on double door frames. Insert plastic plugs in holes to keep holes clear during installation.

K. Plaster Guards and Removable Access Plates: Provide 0.016-inch- (0.4-mm-) thick plaster guards or dust-cover boxes of same material as frame, welded to frame at back of hardware cutouts to close off interior of openings and prevent mortar or other materials from obstructing hardware operation. Provide removable access plates in the heads of frames to receive overhead concealed door closers.

2.6 STOPS AND MOLDINGS

A. Provide continuous stops and moldings around solid, glazed, and louvered panels where indicated.

B. Form fixed stops and moldings integral with frame, on the exterior (non-secured) side of the frame.

C. Provide removable stops and moldings formed of 0.032-inch- (0.8-mm-) thick steel sheets matching steel frames. Secure with countersunk oval head machine screws spaced uniformly not more than 12 inches (300 mm) o.c. Form corners with butted hairline joints.

D. Coordinate rabbet width between fixed and removable stops with type of glass or panel and type of installation indicated.

2.7 FABRICATION

A. Fabricate doors and frames rigid, neat in appearance, and free of defects, warp, wave, and buckle. Accurately form metal to sizes and profiles indicated. Accurately machine, file, and fit exposed connections with hairline joints. Weld exposed joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

B. Exposed Fasteners: Provide countersunk flat heads for exposed screws and bolts, unless otherwise indicated.

C. Hardware Preparation: Prepare doors and frames to receive hardware, including cutouts, reinforcement, mortising, drilling, and tapping, according to final hardware schedule and templates provided by hardware supplier. Secure reinforcement by spot welding. Comply with applicable requirements of ANSI A115 Series specifications for door and frame preparation for hardware. Factory-reinforce doors and frames to receive surface-applied hardware. Factory drill and tap for surface-applied hardware, except at pushplates and kickplates provide reinforcing only.

1. Locate hardware as indicated on the drawings or in Division 08 Section "Door Hardware" or, if not indicated, according to HMMA 831, "Recommended Hardware Locations for Custom Hollow Metal Doors and Frames."

2.8 METALLIC-COATED STEEL FINISHES

A. General: Clean, treat and prime surfaces of fabricated steel door and frame work, inside and out, whether exposed or concealed in the construction.

B. Surface Preparation: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

C. Factory Priming for Field-Painted Finish: Apply shop primer immediately after surface preparation and pretreatment. Apply a sufficient number of coats, baked on, to obtain uniformly smooth exposed surfaces. Touch up surfaces having runs, smears, or bare spots.

1. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free, primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for zinc-coated steel; compatible with substrate and field-applied finish paint system indicated.

2.9 STEEL SHEET FINISHES

A. General: Clean, treat and prime surfaces of fabricated steel door and frame work, inside and out, whether exposed or concealed in the construction.

B. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale, shavings, filings, and rust, if present, complying with SSPC-SP 3, "Power Tool Cleaning,"

C. Factory Priming for Field-Painted Finish: Apply shop primer immediately after surface preparation and pretreatment. Apply a sufficient number of coats, baked on, to obtain uniformly smooth exposed surfaces. Touch up surfaces having runs, smears, or bare spots.

1. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, corrosion-inhibiting, lead- and chromate-free, universal primer complying with ANSI A250.10 acceptance criteria; compatible with substrate and field-applied finish paint system indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install doors and frames according to DHI A115.IG, the Architect reviewed shop drawings, and manufacturer's written recommendations and installation instructions.

B. Frames: Install frames where indicated. Extend frame anchorages below fills and finishes. Coordinate the installation of built-in anchors for wall and partition construction as required with other work.

1. Welded Frames:

a. Placing Frames: Set frames accurately in position; plumb; align, and brace securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1) Field splice only at approved locations indicated on the shop drawings. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.
2) Remove spreader bars only after frames are properly set and secured.

2. At fire-rated openings, install frames according to NFPA 80.

C. Doors:

1. Non-Fire Rated Doors: Fit non-fire-rated doors accurately in their respective frames, with the following clearances:

a. Jambs and Head: 3/32 inch (2 mm).
b. Meeting Edges, Pairs of Doors: 1/8 inch (3 mm).
c. Bottom: 3/8 inch (9 mm), if no threshold or carpet.
d. Bottom: 1/8 inch (3 mm), at threshold or carpet.

D. Wood Door Installation: Refer to Division 08 Section "Flush Wood Doors."

E. Apply hardware in accordance with hardware manufacturer's instructions and Division 08 Section "Door Hardware." Drill and tap for machine screws as required. Do not use self tapping sheet metal screws. Adjust door installation to provide uniform clearance at head and jambs, and to contact stops uniformly. Adjust hardware items just prior to final inspection. Leave work in complete and proper operating condition.

3.2 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items just before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames that are warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

1. Finish Painting: Refer to Division 09 Section "[Interior]Painting."

C. Remove and replace defective work, including doors or frames that are warped, bowed, or otherwise defective.

D. Institute protective measures required throughout the remainder of the construction period to ensure that steel doors and frames will be without any damage or deterioration, at time of substantial completion.

END OF SECTION 08 11 13

SECTION 08 14 16 – FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes solid core flush wood doors.

1. The integration of a security system into the flush wood door work may be required. The Contractor shall be responsible for the total and complete coordination of the security system components into the Work.

1.2 SUBMITTALS

A. Product Data: Submit product data for each type of door required. Include factory-finishing specifications.

1. Submit laboratory test report results of hinge loading, cycle/slam, stile edge screw withdrawals, and stile edge split resistance for fire rated doors.

B. Shop Drawings: Submit shop drawings indicating location, size, thickness, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; mortises, holes, and cutouts for factory machined doors; requirements for veneer matching; factory finishing; fire label requirements including fire rating time duration, maximum temperature rise requirements, and smoke label requirements; undercuts, special beveling, and other pertinent data.

1.3 QUALITY ASSURANCE

A. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated, 8th Edition, Version 1.0, Section 1300."

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect wood doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in heavy duty cardboard cartons.

C. Handle wood doors with clean gloves. Lift and carry wood doors when moving them around the site, do not drag wood doors across one another.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until wet work , such as concrete, stone, tile, and wallboard joint treatment, is complete and dried, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period. Do not expose doors to sudden changes in temperature such as forced heat used to dry out the site.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship for the life of the original installation of the door.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods Inc.
2. Eggers Industries; Architectural Door Division.
3. Marshfield Door (formally Weyerhaeuser Company).
4. VT Industries

2.2 DOOR CONSTRUCTION

A. Provide doors made with adhesives and composite wood products that do not contain added urea-formaldehyde resins.

B. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-1, made with binder containing no urea-formaldehyde resin.

C. Doors for Opaque Finish:

1. Grade: Premium.
2. Faces for Interior Doors: Medium-density overlay.
3. Thickness: 1-3/4 inch (45-mm) unless otherwise indicated.
4. Construction: AWI Section 1300, PC-5 CE, particleboard core. Provide blocking for doors with closers, exit devices, and plates.

a. Use particleboard made with binder containing no urea-formaldehyde resin.

D. Plastic-Laminate-Faced Doors:

1. Grade: Premium.
2. Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS, minimum 0.050 inch thick.
3. Colors, Patterns, and Finishes: As selected from laminate manufacturer's full range of products.
4. Thickness: 1-3/4 inch (45-mm) unless otherwise indicated.
5. Construction: AWI Section 1300, PC-HPDL-5, particleboard core. Provide blocking for doors with closers, exit devices, and plates.

    a. Use particleboard made with binder containing no urea-formaldehyde resin.

E. Wood Beads for Light Openings in Wood Doors: Manufacturer's standard flush designed, solid wood, rectangular shaped, back beveled or quirked, beads matching veneer species of door faces. Include glazing compounds or tapes sized for back bevel or quirk provided. Include finish nails for removable stops sized in accordance with wood door manufacturer's recommendations.

2.3 FABRICATION

A. Fabricate doors in sizes indicated for Project-site fitting.

B. Factory fit doors to suit frame-opening sizes indicated.

1. Comply with clearance requirements of referenced quality standard for fitting.

C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3 unless otherwise indicated to match existing frame hardware preparations. Comply with final hardware schedules, door frame Shop Drawings, AWI Section 1300-G-20, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required. Install light beads with fasteners spaced for opening size and fire rating indicated. Install wood bead moldings with finish nails and countersink without striking bead. Fill countersunk heads with putty matching wood bead color.

2.4 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces and edges of doors, including cutouts, with one coat of wood primer/sealer as standard with door manufacturer. Surfaces shall be clean and dry before priming. Apply primer/sealer uniformly without bare spots, runs, or sags.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: Apply hardware to new doors in accordance with hardware manufacturer's instructions and Division 08 Section "Door Hardware." For particleboard core doors drill pilot holes of proper size for installing hinge screws. Adjust hardware items just prior to final inspection. Leave work in complete and proper operating condition.

1. Factory wrapping shall be maintained on new doors during construction period, and all hardware shall be installed by cutting the factory wrapping at the mounting location of the hardware item.

B. General Door Installation Standards: Install doors in locations indicated to comply with manufacturer's written instructions, referenced quality standard, and as indicated. Where standards conflict the more stringent shall apply.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge, matching clearances specified for factory prefitting, and to contact stops uniformly. Field cutting, fitting or trimming, if required, shall be executed in a workmanlike manner.

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.

D. Field-Finished Doors: Refer to the following for finishing requirements:

1. Division 09 Section "Interior Painting."

3.2 ADJUSTING AND PROTECTION

A. Rehang or replace doors that do not swing or operate freely.

B. Protection: Protect wood doors to ensure that the wood door work will be without damage or deterioration at the time of Substantial Completion.

1. Refinish or replace wood doors damaged during installation. Replace any new wood doors that are warped, twisted, demonstrate core show through, are not true in plane, or cannot be refinished to the satisfaction of the Architect.

END OF SECTION 08 14 16

SECTION 08 41 13 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section provides for aluminum entrances, storefronts and high performance aluminum terrace doors, including:

1. Aluminum swing entrance doors and framing, including hardware, stripping and thresholds.
2. Aluminum high performance swing terrace doors and framing, including hardware, and stripping.
3. Aluminum trim, and similar items in conjunction with aluminum entrance and storefronts and terrace doors.
4. Painting and coating in conjunction with the above aluminum items.
5. Internal steel and aluminum reinforcements for aluminum entrances and storefronts.
6. Internal and perimeter sealing, joint fillers, and gasketing systems for aluminum entrances and storefronts and terrace doors.
7. Anchors, shims, fasteners, inserts, expansion devices, accessories, support brackets and attachments for aluminum entrances and storefronts and terrace doors.
8. Glass and glazing for aluminum entrances and storefronts and terrace doors.
9. Security system components may be incorporated into the door and frame openings of all aluminum entrance and storefront work at the Owner's option. Cooperate with the Owner's security system contractors if the Owner chooses to incorporate security system components during the course of the Work.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide aluminum entrance, storefront and high performance aluminum terrace doors systems meeting or exceeding the following performance requirements:

1. Structural Properties:

a. Wind Loads: The aluminum entrance and storefront work, including glass, shall be designed, fabricated and installed to withstand a maximum inward and outward wind pressure of 20 lbf/sq. ft. (0.96 kPa).

b. Deflection Limitations:

1) Deflections: Base calculations for the following deflections upon the combination of maximum direct wind loads, building deflections, and erection tolerances.

a) The deflection of any framing member in a direction normal to the plane of the wall when subjected to the full wind loads specified above shall not exceed 1/175 of its clear span or 3/4 inch (19 mm)

whichever is less, except limit deflection of glass to 1/2 inch (13 mm).

b) Glass, sealants and interior finishes shall not be included to contribute to framing member strength, stiffness or lateral stability.

c. Dead Loads:

1) Maximum full deadload deflections, parallel (in-plane) to wall plane, of framing members shall not reduce glass bite or glass coverage, to less than 75 percent of the design dimension, and shall not reduce edge clearance to less than 25 percent of design dimension or 1/8 inch (3 mm) whichever is greater.
2) Limit deflections of metal members spanning door openings to 1/300. The clearance between the member and an operable door shall be no less than 1/16 inch (1.5 mm).
3) Twisting (rotation) of the horizontals due to the weight of the glass shall not exceed 1 degree, measured between ends and center of each span.

d. Operational (Traffic) Loads: Design and fabricate aluminum entrances to withstand the operating loads which result from heavy traffic conditions using the specified hardware, without measurable permanent deflection. Limit elastic deflections so as to provide the normal degree of rigidity required to avoid glass breakage, air leaks and other objectionable results of excessive flexibility. Provide weatherstripping at stiles, sill and head rails of door leaves, to minimize sound leaks.

B. Building Frame Movement: Design, fabricate and install aluminum entrances and storefronts to withstand building movements including loading deflections, shrinkage, creep and similar movements. Building frame deflections, shrinkage, creep and other movements are available from the structural engineer.

C. Glass Statistical Factor: Glass thicknesses when shown on the drawings, or specified, are for convenience of detailing only and are to be confirmed by the Contractor and/or glass manufacturer. All glass for the size openings shown will be provided in thicknesses such that the probability of breakage at the design "Wind Load" will not exceed 8 lights per 1000 lights (S.F. 2.5) based on a 60 second uniform wind load duration.

D. Design Modifications:

1. Submit design modifications necessary to meet the performance requirements and field coordination.
2. Variations in details or materials shall not adversely affect the appearance, durability or strength of components.
3. Maintain the general design concept without altering size of members, profiles and alignment.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each aluminum entrance and storefront product specified.

B. Shop Drawings: Submit shop drawings showing scaled elevations, plans, and sections of the aluminum entrance and storefront work. Full scale sections shall be prepared and submitted for details of the assemblies that cannot be shown in the elevations or sections. Include with shop drawings metal thickness of all metal components, glass thicknesses, metal finishes, and all other pertinent information as necessary or requested by the Architect to indicate compliance with the Contract Documents. Details of field connections, anchorage, and their relationship to the work of others shall be clearly indicated for the coordination of the work by other building trades. Details of fastening and sealing methods and product joinery shall be shown to ensure proper performance of the field installation. No work shall be fabricated until shop drawings for that work have been approved by Architect for fabrication.

1. Hardware Schedule: Organize schedule into sets based on hardware specified. Include name of item and manufacturer, and complete designation of every item required for each entrance door.

C. Samples: Submit samples of the following before any work is fabricated:

1. 3 paired sets of samples for each exposed metal finish required. Sample finishes shall be on the specified alloy, temper, and thickness of metal required for the work. Where finishes involve color and texture variations, include sample sets showing the full range of variations expected. Furnish samples in either 12-inch- (300-mm-) lengths of patch fittings, rails, or 12-inch- (300-mm-)squares of sheet.

D. Structural Calculations: Submit, for information only, copies of structural calculations indicating complete compliance with the specified performance requirements. Calculations shall be prepared, signed and sealed by a Professional Engineer registered in the state wherein the work is to be erected.

E. Product Test Reports: Submit certified product test reports based on tests performed by an AAMA Accredited Laboratory clearly describing in written form, and in shop drawing form, compliance of each aluminum entrance and storefront assembly (each swinging and sliding door) with requirements indicated based on comprehensive testing.

F. Maintenance Instructions: Submit copies of manufacturer's written instructions for adjustment, operation and maintenance of doors.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: The aluminum entrance and storefront drawings and specifications are based on Kawneer Trifab VG 450 systems. The high performance aluminum terrace door drawings and specifications are based on Kawneer 2000T Terrace Door. Award the fabrication of aluminum entrance and storefront door and frame components to a single firm specializing in the fabrication of aluminum entrance and storefront components who has successfully produced work similar in design and extent to that required for the project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 5 years. The fabricator shall have sufficient production capacity, have organized quality control and testing procedures, and published written and illustrated installation manuals, to produce and properly install the entrance assemblies required without causing delay in progress of the Work.

B. Installer Qualifications: Subcontract the aluminum entrance, storefront and sliding mall front work to a firm which is specialized in the erection of entrances and storefronts and who has successfully installed work similar in design and extent to that required for the project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 10 years.

C. Standards: Comply with the applicable provisions and recommendations of the following standards below, where standards conflict the more stringent shall apply:

1. American Architectural Manufacturers Association (AAMA): "Aluminum Store Front and Entrance Design Guide Manual."
2. American Institute of Steel Construction (AISC), "Steel Construction Manual," Current Edition.
3. Steel Structures Painting Council (SSPC): "Steel Structures Painting Manual, Vol. 2, Systems and Specifications."
4. Federal Standard 16 CFR 1201, Consumer Product Safety Commission (CPSC): "Safety Standard for Architectural Glazing Materials," as published in the Code of Federal Regulations (CFR). Comply with the applicable requirements of the laws, codes, ordinances and regulations of Federal and Municipal authorities having jurisdiction, wherever requirements conflict the more stringent shall be required. Obtain approvals from all such authorities. As a minimum provide safety glazing complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
5. Welding Standards: Welding shall be performed by skilled and qualified mechanics. Welding shall be performed in accordance with the applicable provisions of AWS D1.1 "Structural Welding Code - Steel" and AWS D1.2, "Structural Welding Code--Aluminum."

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Prior to the start of the aluminum entrance, storefront and sliding mall front work, and at the Contractor's direction, meet at the site and review the installation procedures and coordination with other work. Meeting shall include Contractor, Owner, aluminum entrance and storefront installer, sealant installer, as well as any other subcontractors or material technical service representatives whose work, or products, must be coordinated with the aluminum entrance and storefront work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging of components shall be so selected to protect the components from damage during shipping and handling.

B. Storage on Site: Store aluminum entrance and storefront components in a location and in a manner to avoid damage to the components. Keep handling on site to a minimum. Exercise particular care to avoid damage to finishes of metals.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of supporting structure by field measurements before fabrication so that the entrance and storefront work will be accurately designed, fabricated and

fitted to the structure. Indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Use Contractor's lines and benchmarks as a basis for measurements.

1.7 WARRANTY

A. Special Warranty: Submit a 2 year written warranty, beginning from date of substantial completion, and executed by the Contractor, manufacturer and the aluminum entrance and storefront installer agreeing to repair or replace components of entrance and storefront systems that develop defects in materials or workmanship within the specified warranty period. Defects include, structural failures, sealant failures, deterioration of metals, metal finishes, failure of operating components to function properly, and any other evidence of failure or deterioration of the aluminum entrance and storefront work to meet performance requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Recycled Content of Aluminum Products: Provide products with an average recycled content so that post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 45 percent.

B. Aluminum: Conform to the requirements published in AA "Aluminum Standards and Data", referenced ASTM standards and the following. All aluminum extrusions shall be manufactured to dimensional tolerances so as to eliminate any edge projection or misalignment at joints. Unless otherwise specified, provide alloy and temper as required to suit performance requirements and finish(es) indicated. Provide concealed extruded bars, rods, shapes and tubes in alloys as recommended by the fabricator to join or reinforce assembly of exposed aluminum components.

1. Alloys:

a. Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).

2. Welding Rods and Bare Electrodes: AWS A5.10.

C. Carbon Steel: For carbon steel components required to join, reinforce or support the assembly of aluminum components provide carbon steel conforming to ASTM A 36/A 36M for structural shapes, plates, and bars; ASTM A 1008/A 1008M for cold-rolled sheet and strip; or ASTM A 1011/A 1011M for hot-rolled sheet and strip.

D. Glass and Glazing Materials: As specified in Division 08 Section "Glazing."

E. Anchors and Fasteners:

1. Material: Cadmium plated steel.

2. Anchor and Fastener Metal Alloy Types, Designations and Standards: Alloys as selected by fabricator to prevent corrosion resistance with the components fastened. Do not use self-drilling, self-tapping type fasteners.
3. Do not use exposed anchors and fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.
4. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.

F. Weather Stripping: Manufacturer's standard replaceable weather stripping as follows:

1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.

2.2 FRAMING SYSTEMS

A. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 HARDWARE

A. General: Provide hardware indicated and as scheduled. Finish exposed parts to match butt or pivot finish, unless otherwise indicated.

B. Ball-Bearing Butts: FBB199(US32D); Stanley Commercial Hardware (STH), 5-knuckle. 4-1/2 inches (114 mm) h. x 4 inches (102 mm) or 4-1/2 inches (114 mm) w. for doors up to and including 36 inches (914 mm) in width; 5 inches (127 mm) h. x 4 inches (102 mm) or 4-1/2 inches (114 mm) w. for doors greater than 36 inches (914 mm) in width. Provide non-removable pins at hinges exposed to non-secure side. Provide 3 hinges at each leaf for doors up to 36 inches (914 mm) wide and 80 inches (2032 mm) tall; provide 4 hinges at each leaf for taller doors. BHMA 630 satin stainless steel finish.

1. Provide manufacturer’s aluminum 3-way adjustable butt hinges at high performance aluminum terrace doors.

C. Closers, General: Comply with manufacturer's recommendations for closer size, depending on door size, exposure to weather, and anticipated frequency of use.

1. Closing Cycle: Comply with requirements of authorities having jurisdiction or the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," whichever are more stringent.
2. Opening Force: Comply with the following maximum opening-force requirements for locations indicated:

a. Exterior Entrance Doors: 5 lbf (22.2 N).

D. Surface-Mounted Overhead Closers (entrance doors): 4110/4010; LCN Closers (LCN). Provide arms and metal cover with plated finish to match butt hinge or pivot.

1. Hold Open: None.

E. Surface-Mounted Overhead Closers (terrace doors): 1260 LCN Closer (LCN). Provide arms and metal cover with plated finish to match butt hinge or pivot.

1. Hold Open: None.

F. Door Stops (terrace doors): manufacturer's stainless steel door stop assembly concealed in top rail of door leaf.

G. Cylinders: As specified in Division 08 Section "Door Hardware."

H. Mortise Cylinders : Manufacturer's standard, 6-pin, mortised cylinders complying with BHMA A156.5, Grade 1 requirements.

I. Deadlock (entrance doors): Manufacturer's standard mortise deadlock with minimum 1-inch- (25.4-mm-) long throw bolt and complying with BHMA A156.5, Grade 1 requirements.

1. Two-Point Locking: Provide bottom bolt and mechanism that automatically throws active-leaf bottom bolt into threshold when deadlock engages inactive leaf and provides one-stage unlocking.

J. Deadlock (terrace doors): Manufacturer's standard stainless steel deadbolt gearbox and strike plates with plastic dust box.

K. Shoot Bolt and Sleeve (terrace doors-pairs): top and bottom stainless steel shoot bolts to secure inactive leaf to transom and threshold.

L. Lockset Faceplates (entrance doors): Manufacturer's standard extruded-aluminum faceplate for lock type indicated that lays flush with door stile.

1. Provide radiused faceplate with weather sweep extending full length of lock at meeting stiles of pairs of doors.

M. Flat Face Strikes (entrance doors): Manufacturer's standard stainless-steel, flat face strike with steel mounting plate and black-plastic dustbox.

N. Push/Pulls (entrance doors): Ives 9103E2 US32D

O. Thresholds (entrance doors): Provide manufacturer's standard double bevel saddle threshold with mitered returns and with cutouts coordinated for operating hardware, with anchors, and not more than 1/2-inch- (12.7-mm-) high, with beveled edges providing a floor level change with a slope of not more than 1:2, and in the following material:

1. Material: Bronze, mill finish.

2.4 SEALING MATERIALS

A. Concealed Sealing Materials: All sealing materials concealed within the entrances and storefronts shall be silicone, compatible with and adherent to each material it will be in contact with, as recommended by the manufacturer to fulfill performance requirements.

B. Exposed Sealing Materials: Sealants, exposed at entrance and storefront perimeter joints in contact with adjacent cladding materials are specified in Division 07 Section "Joint Sealants."

2.5 FABRICATION

A. General: Fabricate the entrances and storefronts to the designs, shapes, and sizes shown using the materials specified and shown to produce assemblies which meet or exceed the performance requirements. To the greatest extent possible complete fabrication, assembly, finishing, hardware applications and other work before shipment to Project site.

1. Metal Wall Thickness: Provide shapes as shown and as required to suit the performance requirements but with wall thickness of not less than 1/8 inch (3 mm).
2. Entrance Door Stile and Rail Dimensions:

   a. Bottom rails: Provide minimum 10 inches (254 mm) high one piece bottom rail unless otherwise indicated on the drawings.
   b. Stiles and Top Rail Dimensions: Narrow stile; 2-inch (50.8-mm) nominal width.
   c. Door Thickness: 1-3/4 inches (44.5 mm).
   d. Preglaze door units to greatest extent possible, in coordination with installation and hardware requirements. Install ¼ inch clear, fully tempered glass. Glazing, whether in factory or in field, shall be performed in accordance with Division 08 Section "Glazing."
   e. Fabricate all doors and frames to accommodate the swing direction shown.

3. Provide extruded aluminum entrance door inserts at door frames designed with bosses sized to receive selected door gasket.

4. Terrace Door Stile and Rail Dimensions:

   a. Bottom rails: 4 13/32 inch high one piece bottom rail.
   b. Stiles and Top Rail Dimensions: 4 13/32 inch width.
   c. Door Thickness: 2 ¼ inch.
   d. Liner Frame: provide maunufacturer's liner frame and sill to be integrally installed within storefront framing system.
   e. Preglaze door units to greatest extent possible, in coordination with installation and hardware requirements. Install 1 inch insulated, fully tempered low-e units. Glazing, whether in factory or in field, shall be performed in accordance with Division 08 Section "Glazing."
   f. Fabricate all doors and frames to accommodate the swing direction shown.

B. Provide continuous interior glazing stops with concealed fasteners for all doors and frames. Provide stops with hairline joints at corners. Provide stops with square, not beveled, shouldered profile unless otherwise shown.

C. Doors and frames shall be cut, reinforced, drilled and tapped in strict accordance with the printed door hardware manufacturer's templates and instructions. Provide solid stainless steel or bronze hardware reinforcements, securely fastened to doors and frames where door hardware is to be attached.

1. Security system components may be incorporated into the door and frame openings of all entrance doors and frames. Provide all cutouts required by the Owner's security system vendor and all prewiring for vendor provided security system devices. Wherever storefront and entrance framing components are to receive wiring provide unobstructed clear paths free of burrs and sharp objects with pull strings to facilitate wiring.

D. Joints in Metal Work: All exposed work shall be carefully fitted and matched to produce continuity of line and design, with all joints, being accurately fitted for hairline contact and rigidly secured. Where additional rigidity or strength is required to satisfy the performance requirements reinforce entrance components with aluminum or carbon steel shapes, bars, and plates.

E. Shop Assembly: As far as practicable, all fitting and assembly work shall be done in a fabrication shop.

1. For exterior entrances, provide weepholes and internal water passages in the glazing framing recesses as recommended by the respective glass and framing manufacturers to conduct infiltrating water to the exterior. Provide weep baffles secured to inside of frame behind weepholes.

F. Exposed Fasteners: Not permitted.

G. Protection of Metals: Wherever dissimilar metals are in contact, except in the case of aluminum in contact with galvanized steel, zinc, separate such surfaces with a coating of zinc rich primer, bituminous paint, or separation gaskets as the condition requires. Wherever aluminum comes in contact with concrete surfaces separate such surfaces with a coating of zinc rich primer, bituminous paint, or separation gaskets as the condition requires.

2.6 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Finish Application:

1. Apply high performance organic coatings to all exposed exterior surfaces of storefront and entrance components. Apply thermosetting acrylic enamel coatings to all exposed interior surfaces of storefront and entrance components and mall front components.
2. Extent of Coating Types:

a. High Performance Organic Coating: Apply high performance organic coatings to all exposed surfaces of exterior (weathering side) snap on exterior caps, metal panels, column covers, and the exposed interior surfaces of the main entry lobby ground floor storefront.

C. Appearance of Finished Work: During production, maintain large size color range samples for use in comparing against production material. Variations in appearance of abutting or adjacent pieces are acceptable if they are within the range of approved samples. Noticeable variations in the same piece are not acceptable.

D. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

E. High-Performance Organic Coating Finish: AA-C12C42R1x and the following:

1. Polyvinylidene fluoride finish coating containing not less than 70 percent of "ATO Atochem Kynar 500" or "Ausimont Hylar 5000" fluorocarbon resin specially formulated for spray application to extrusions and preformed aluminum metal shapes. Remove die markings, scratches, abrasions, dents and other blemishes before applying finish. Coating films shall be uniform and visibly free from flow lines, streaks, blisters, sags or other surface imperfections in the dry-film state on all surfaces.

a. Metal Preparation and Pretreatment: Pretreatment of aluminum surface and application of the finish shall be performed under specifications issued by the licensed formulator to approved applicator and the following as a minimum:

1) The products used to form the chemical conversion coating on aluminum extrusions shall conform with ASTM D1730, Type B, Method 5 (Amorphous Chromium Phosphate Treatment) or Method 7 (Amorphous Chromate Treatment).
2) The coating weight of the chemical conversion coating shall be a minimum of 40 mg. per $ft.^2$ on exposed surfaces as specified in ASTM B449, Section 6, Class I. Processing shall conform with that specified in ASTM B449, Section 5.

b. Thickness:

1) Fluoropolymer 2-Coat Coating System: Minimum 1.2 mil total dry film thickness (0.25 mil primer +/- 0.05 mil and 1.0 mil topcoat).

c. Coating Performance Criteria: Meets or exceeding AAMA 2605.
d. Color: One custom color to be determined by Architect.
e. Manufacturer, Coating System:

1) 2-Coat, Opaque System; one of the following:

a) PPG Industries; Duranar.
b) Valspar, Inc.; Fluropon Standard.

2.7 GLAZING SYSTEMS

A. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:

1. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

    a. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.8 ACCESSORY MATERIALS

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."

1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate entrance and storefront work with the work of other Sections and provide items to be placed during the installation of other work at the proper time to avoid delays in the work.

B. Place such items, including concealed overhead framing, accurately in relation to the final location of entrance and storefront components.

3.2 EXAMINATION

A. Examine the substrates, adjoining construction, and conditions under which the Work is to be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Before beginning installation of the entrance and storefront work examine all parts of the existing building structural frame and the existing building cladding indicated to support the entrance and storefront work. Ensure that the existing swing door thresholds, existing swing doors, swing door framing and subframes have been completely removed with all projecting anchors cut off flush. Notify Contractor in writing, of any dimensions, or conditions, found which will prevent the proper execution of the entrance and storefront work, including specified tolerances. Use Contractor's offset lines and bench marks as basis of measurements.

3.3 INSTALLATION

A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame

joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints.

1. Cut and trim component parts of the entrance and storefront work during erection only with the approval of the manufacturer or fabricator, and in accordance with his recommendations. Restore finish completely to protect material and remove all evidence of cutting and trimming. Remove and replace members where cutting and trimming has impaired strength or appearance, as directed by Architect.
2. Set components within the erection tolerances with uniform joints. Place components on shims and fasten to supporting substrates using bolts and similar fasteners. Use stainless steel shims at structural connections only. U shaped shims at structural connections are not permitted. Use aluminum, stainless steel, or high impact polystyrene shims at other connections.
3. Do not erect components that are warped, deformed, bowed, dented, defaced or otherwise damaged as to impair its strength or appearance. Remove and replace members damaged in the process of erection.
4. No holes or slots shall be burned, cut into, or field drilled in any building framing member without the written acceptance of the structural engineer.

B. Entrance and Storefront Framing: Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.

C. Entrance Doors: Doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Adjust doors to operate smoothly, without binding, with hardware functioning properly. Weatherstripping contact, and hardware movement, shall be field-tested and final adjustment, and lubrication, made for proper operation and performance of doors.

1. Door Hardware: Refer to Division 08 Section "Door Hardware."
2. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.

D. Terrace Doors: Doors shall be securely anchored in place to a straight, plumb and level condition, without distortion, fully integrated with storefront framing. Adjust doors to operate smoothly, without binding, with hardware functioning properly. Weatherstripping contact, and hardware movement, shall be field-tested and final adjustment, and lubrication, made for proper operation and performance of doors

E. Install glazing to comply with requirements of Division 08 Section "Glazing," unless otherwise indicated.

F. Install perimeter sealant to comply with requirements of Division 07 Section "Joint Sealants," unless otherwise indicated.

G. Concealed Sealing Components: Apply sealant and gasket components that are integral to the entrance and storefront systems in strict accordance with the each component manufacturer's printed instructions. Before applying components remove all mortar, dust, dirt, moisture, and other foreign matter that will be deleterious to the intended performance of the component. Mask adjoining exposed surfaces to avoid spilling, dripping, dropping or other unintended contact of the sealing components onto adjacent exposed surfaces.

3.4 ERECTION TOLERANCES

A. The entrance and storefront systems shall be fabricated and erected to accommodate the dimensional tolerances of the structural frame while providing the following as installed tolerances.

1. Variation from theoretical calculated position as located in plan or elevation in relation to established floors lines, column lines and other fixed elements of the structure, including variations from plumb, level, straight and member size: +/- 1/4 inch max in any 20'-0" (+/- 6 mm in any 6 m) run, column-to-column bay, or floor-to-floor height.
2. Alignment: Where surfaces abut in line, and meet at corners, limit offset from true alignment to 1/32 inch (.75 mm).
3. Variation from angle, or plumb, shown: +/- 1/8 inch max in any 10'-0" (+/- 3 mm in any 3 m) run or story height, non-cumulative.
4. Variation from slope, or level, shown: +/- 1/8 inch max in any 20'-0" (+/- 3 mm in any 6 m) run or column-to-column bay, non-cumulative.

3.5 ANCHORAGE

A. Anchorage of the entrance and storefront work to the structure shall be in accordance with the accepted shop drawings.

3.6 WELDING

A. Weld with electrodes and by methods recommended by manufacturer of material being welded, and in accordance with AWS D1.1 for concealed steel members.

B. Welds and adjacent metal areas shall be thoroughly cleaned and coated with a single coat of bituminous paint.

3.7 REMOVAL OF DEBRIS

A. All debris caused by, or incidental to, the erection of the entrance and storefront work shall be removed from the site and disposed of legally.

3.8 CLEANING

A. Clean metal surfaces promptly after installation, exercising care to avoid damage to factory finished exposed surfaces.

B. Wash glass on both faces not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer. Remove excess glazing and sealant compounds, dirt, and other substances.

C. Immediately remove any deleterious material from surfaces of aluminum.

3.9 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that entrance and storefront work will be without damage or deterioration, at time of acceptance.

END OF SECTION 08 41 13
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SECTION 08 71 00 - DOOR HARDWARE

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. Commercial door hardware for the following:

a. Swinging doors.
b. Sliding doors.
c. Folding doors.
d. Other doors to the extent indicated.

2. Cylinders for doors specified in other Sections.
3. Electrified door hardware.

B. Related Sections include the following:

1. Division 8 Section "Steel Doors and Frames" for astragals provided as part of a fire-rated labeled assembly and for door silencers provided as part of the frame.
2. Division 8 Section "Flush Wood Doors" for astragals provided as part of a fire-rated labeled assembly.
3. Division 8 Section "Aluminum Entrances and Storefronts" for entrance. Division 8

1.3 SUBMITTALS

A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of door hardware indicated.

C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.

    a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.

3. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
4. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.

D. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

C. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

D. Regulatory Requirements: Comply with provisions of the following:

1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, Delete items of door hardware below not required.

E. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

1. Test Pressure: Test at atmospheric pressure.

F. Keying Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Incorporate keying conference decisions into final

keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Address for delivery of keys.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver keys to manufacturer of key control system.

D. Deliver keys to Owner by registered mail or overnight package service.

1.6 COORDINATION

A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

B. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies fire alarm system and detection devices access control system security system.

1.7 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.

2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period for Locks: Ten years.

D. Warranty Period for Manual Closers: Twenty-Five years.

E. Warranty Period for Exit Devices: Ten years.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this the door hardware sets indicated in door and frame schedule

2.2 HINGES AND PIVOTS

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hinges:

a. Bommer Industries, Inc. (BI).
b. PBB Hinges (PBB).
c. Zero International Inc.
d. Select Products (Select)

C. Standards: Comply with the following:

1. Butts and Hinges: BHMA A156.1. Grade 1
2. Template Hinge Dimensions: BHMA A156.7.
3. Pivots: BHMA A156.4.

D. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).

4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

E. Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches) Standard Weight	Metal Thickness (inches) Heavy Weight
32 by 84 by 1-3/8	3-1/2	0.123	-
36 by 84 by 1-3/8	4	0.130	-
36 by 84 by 1-3/4	4-1/2	0.134	0.180
42 by 90 by 1-3/4	4-1/2	0.134	0.180
48 by 120 by 1-3/4	5	0.146	0.190

F. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:

1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:

   a. Out-swinging exterior doors.
   b. Out-swinging corridor doors with locks.

2.3 LOCKS AND LATCHES

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Mechanical Locks and Latches: Mortise Locks and Latches: BHMA A156.13 Grade 1.

   a. Dorma Architectural Hardware.
   b. Schlage Lock, Division of Ingersoll Rand.

2.4 DOOR BOLTS

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flush Bolts:

    a. Rockwood Manufacturing Company (RM).
    b. Triangle Brass Manufacturing Company, Inc. (TBM).

C. Standards: Comply with the following:

1. Surface Bolts: BHMA A156.16.
2. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
3. Manual Flush Bolts: BHMA A156.16.

2.5 EXIT DEVICES

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Dorma Architectural Hardware
2. Von Duprin; an Ingersoll-Rand Company (VD).

C. Standard: BHMA A156.3.

1. BHMA Grade: 1

2.6 CYLINDERS AND KEYING

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cylinders: Same manufacturer as for locks and latches.
2. Cylinders: Interchangeable removable cores.

C. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:

1. Number of Pins: Seven.
2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
3. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Interchangeable Cores: Core insert, removable by use of a special key, and usable with other manufacturers' cylinders.

2. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

E. Construction Keying: Comply with the following:

1. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

a. Replace construction cores with permanent cores, as indicated in keying schedule.

F. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:

1. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.

G. Keys: Provide nickel-silver keys complying with the following:

1. Quantity:

a. Cylinder Change Keys: Two.
b. Master Keys: Two.
c. Grand Master Keys: Two.
d. Control Keys: Two.
e. Construction Keys: Two
f. Construction Key: Five

H. 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:

2.7 CLOSERS

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Surface-Mounted Closers:

a. DORMA Architectural Hardware,
b. LCN Closers 4041 series.

C. Standards: Comply with the following:

1. Closers: BHMA A156.4. Grade 1.

2.8 PROTECTIVE TRIM UNITS

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Metal Protective Trim Units:

a. Rockwood Manufacturing Company (RM).
b. Triangle Brass Manufacturing Company, Inc. (TBM).

2.9 STOPS AND HOLDERS

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:

B. Standards: Comply with the following:

1. Stops and Bumpers: BHMA A156.16.
2. Combination Overhead Holders and Stops: BHMA A156.8.
3. Door Silencers: BHMA A156.16.

C. Stops and Bumpers: BHMA Grade 1.

D. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.

E. Silencers for Wood Door Frames: BHMA Grade 1; neoprene or rubber, minimum 5/8 by 3/4 inch (16 by 19 mm); fabricated for drilled-in application to frame.

F. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

2.10 DOOR GASKETING

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Door Gasketing:

a. Reese Enterprises, Inc. (RE).
b. Zero International, Inc. (ZRO).

2. Door Bottoms:

a. Reese Enterprises, Inc. (RE).
b. Zero International, Inc. (ZRO).

C. Standard: Comply with BHMA A156.22.

D. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

2.11 THRESHOLDS

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Reese Enterprises, Inc. (RE).
2. Zero International, Inc. (ZRO).

C. Standard: Comply with BHMA A156.21.

2.12 MISCELLANEOUS DOOR HARDWARE

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Rockwood Manufacturing Company (RM).
2. Triangle Brass Manufacturing Company, Inc. (TBM).

C. Standard: Comply with the following:

1. Auxiliary Hardware: BHMA A156.16.
2. Exit Alarms: BHMA A156.5.

2.13 FABRICATION

A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and

BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

B. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Steel Machine or Wood Screws: For the following fire-rated applications:

    a. Mortise hinges to doors.
    b. Strike plates to frames.
    c. Closers to doors and frames.

3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:

    a. Surface hinges to doors.
    b. Closers to doors and frames.
    c. Surface-mounted exit devices.

4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.14 FINISHES

A. Standard: Comply with BHMA A156.18.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 600: Primed for painting, over steel base metal.
2. BHMA 605: Bright brass, clear coated, over brass base metal.
3. BHMA 606: Satin brass, clear coated, over brass base metal.
4. BHMA 609: Satin brass, blackened, satin relieved, clear coated, over brass base metal.

5. BHMA 611: Bright bronze, clear coated, over bronze base metal.
6. BHMA 612: Satin bronze, clear coated, over bronze base metal.
7. BHMA 613: Dark-oxidized satin bronze, oil rubbed, over bronze base metal.
8. BHMA 618: Bright nickel plated, clear coated, over brass or bronze base metal.
9. BHMA 619: Satin nickel plated, clear coated, over brass or bronze base metal.
10. BHMA 622: Flat black coated, over brass or bronze base metal.
11. BHMA 623: Light-oxidized statuary bronze, clear coated, over bronze base metal.
12. BHMA 624: Dark-oxidized statuary bronze, clear coated, over bronze base metal.
13. BHMA 625: Bright chromium plated over nickel, over brass or bronze base metal.
14. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
15. BHMA 627: Satin aluminum, clear coated, over aluminum base metal.
16. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
17. BHMA 629: Bright stainless steel, over stainless-steel base metal.
18. BHMA 630: Satin stainless steel, over stainless-steel base metal.
19. BHMA 651: Bright chromium plated over nickel, over steel base metal.
20. BHMA 652: Satin chromium plated over nickel, over steel base metal.
21. BHMA 689: Aluminum painted, over any base metal.
22. BHMA 690: Dark bronze painted, over any base metal.
23. BHMA 691: Light bronze painted, over any base metal.
24. BHMA 717: Bright aluminum, uncoated; aluminum base metal.
25. BHMA 718: Satin aluminum, uncoated; aluminum base metal.
26. BHMA 722: Dark-oxidized bronze, oil rubbed, over architectural bronze base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 series.

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.

B. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.5 DOOR HARDWARE SCHEDULE

HARDWARE GROUP 1

1Pr. GATESExterior to Patio
1Pr. GATESExterior to Service Corridor

All hardware by door supplier
2 IC Padlocks
2 Core 77 SKC 626 Dorma

HARDWARE GROUP 2

1 Sgl. Door Patio fr Bar

1 Hinge	SL11	628	Select
1 Lock	MS1850	628	Adams Rite
2 Cylinder	97G D100	626	Dorma
1 Push/Pull	1737	630	Trimco
1 Closer	8916AF89J BP89	689	Dorma
1 Threshold	566A	628	Zero
1 Stop	1209		Trimco

HARDWARE GROUP 3

1 Pr. Doors Patio fr Dining

2 Hinge	SL11	628	Select
1 Lock	MS1850	628	Adams Rite
2 Flush Bolts	3915	626	Trimco
1 DP Strike	3910	626	Trimco
2 Cylinder	97G D100	626	Dorma
2 Push/Pull	1737	630	Trimco
1 Closer	8916AF89J BP89	689	Dorma
1 Threshold	566A	628	Zero
2 Stop	1209		Trimco
1 Sign			

HARDWARE GROUP 4

1 Sgl. Door Patio fr Dining

1 Hinge	SL11	628	Select
1 Exit Device	5301 C JP03	630	Dorma
1 Closer	8916AF89J BP89	689	Dorma
1 Threshold	566A	628	Zero
1 Stop	1209		Trimco

HARDWARE GROUP 5

1 Sgl. Door Exterior fr Receiving

1 Hinge	SL305	630	Select
1 Exit Device	9300	630	Dorma
1 Trim	ETDL	626	Alarm
1 Cylinder	77D100	626	Dorma
1 Closer	8916S-DS	689	Dorma
1 Viewer	976	626	Trimco
2 Armor Plates	KA0038 45" x 35"	630	Trimco
1 Door Edge	KE37-1 45"	630	Trimco
1 Drip Cap	142	628	Zero
1 Seal	326AA	628	Zero

1 Door Bottom	355	628	Zero
1 Threshold	566A	628	Zero
1 Stop	1209		Trimco

HARDWARE GROUP 6

1 Sgl. Door Receiving fr Bar

3 Hinge	BB81 4.5 x 4.5	652	PBB
1 Exit Device	9300 YG08	630	Dorma
1 Closer	8916S-DST	689	Dorma
1 Kick Plate	K0038 8" x 34"	630	Trimco
1 Stop	1209		Trimco

HARDWARE GROUP 6

1 Sgl. Door Dining fr Bar

1 Operator	RTS-03 x 8575	626	Dorma
2 Push Plate	1001-11	630	Dorma
1 Kick Plate	K0038 8" x 34"	630	Trimco
1 Stop	1209		Trimco

HARDWARE GROUP 7

1 Sgl. Door Kitchen 120 to Office 110

3 Hinge	BB81 4.5 x 4.5	652	PBB
1 Lock	ML9050 C LGA	626	Dorma
1 Closer	8916AF	689	Dorma
1 Kick Plate	K0038 8" x 34"	630	Trimco
1 Stop	1211		Trimco

HARDWARE GROUP 8

1 Sgl. Door Vestibule fr Janitor 101

3 Hinge	BB81 4.5 x 4.5	652	PBB
1 Lock	ML9080 C LGA	626	Dorma
1 Closer	8916DS	689	Dorma
1 Kick Plate	K0038 8" x 34"	630	Trimco
1 Stop	1211		Trimco

HARDWARE GROUP 9

1 Sgl. Door Vestibule to Men 103
1 Sgl. Door Vestibule to Women 102

3 Hinge	BB81 4.5 x 4.5	652	PBB
1 Lock	DB9963 C	626	Dorma
1 Push	1001-9	630	Trimco

1 Pull	1013-3B	630	Trimco
1 Closer	8916DS	689	Dorma
1 Kick Plate	K0038 8" x 34"	630	Trimco
1 Stop	1209		Trimco

END OF SECTION 08 71 00

SECTION 08 80 00 – GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.
2. Doors.
3. Storefront framing.

B. Refer to Division 08 "Aluminum-Framed Entrances and Storefronts" for requirements applicable to single subcontract responsibility for glazing.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide and install watertight and airtight glazing systems capable of withstanding thermal movement and wind and impact loads without failure of any kind, including loss or breakage of glass, failure of seal or gaskets, exudation of glazing sealants, and excessive deterioration of glazing materials.

B. Glass Design: Glass thicknesses and heat treatments indicated are minimum requirements. Glazing details shown are for convenience of detailing only and are to be confirmed by the Contractor relative to cited standards and final framing details. Confirm glass thicknesses and heat treatments, verified by analysis, as required to meet the performance and testing requirements specified in Division 08 Section "Aluminum-Framed Entrances and Storefronts".

C. Thermal and Optical Performance Properties: Provide insulating glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- (13-mm-) wide interspace.
2. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F (W/sq. m x K).
3. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
4. Solar Optical Properties: NFRC 300.

1.3 SUBMITTALS

A. Product Data: Submit product data for each glass product and glazing material indicated.

B. Thermal Stress and Wind Load Analyses: Submit the following from the glass manufacturer:

1. Thermal stress analysis for each exterior glass unit type, each building elevation. The analysis shall clearly indicate all the expected service temperature ranges and the effects of partial and full shading on the glass. Append to the thermal stress analysis a statement from the glass manufacturer that based upon this analysis that the resulting thermal stresses will not reduce the specified "statistical probability of breakage."
2. Wind load analysis for each glass unit type, each building elevation. The analysis shall clearly indicate that the statistical probability of breakage at the design wind pressure will not exceed the specified statistical probability of breakage.

C. Samples: Label samples to indicate product, characteristics, and locations in the work. Furnish samples of the following:

1. Except for clear glass, submit samples of each glass type specified, in the form of 12-inch- (300-mm-) square Samples.
2. Submit samples of each glass type specified where production run variations, and defects are expected.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

E. Glass Treatment Certificates: Submit glass treatment certificates signed by manufacturer of the heat soaked glass products certifying that products furnished comply with requirements.

F. 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.

G. Product Test Reports: Submit product test reports for each type of glazing sealant and gasket indicated.

H. Warranties: Submit special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Glass and Glass Accessories: Obtain glass and glass accessories from one source for each product indicated below:

1. Primary glass.
2. Coated glass.
3. Heat treated glass.
4. Insulating glass.
5. Glazing gaskets.

C. Safety Glass: Comply with the applicable requirements of the laws, codes, ordinances and regulations of Federal and Municipal authorities having jurisdiction, wherever requirements conflict the more stringent shall be required. Obtain approvals from all such authorities. As a minimum provide Category II materials complying with testing requirements in 16 CFR 1201 (Consumer Product Safety Commission "Safety Standard for Architectural Glazing Materials," as published in the Code of Federal Regulations) and ANSI Z97.1.

1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."

E. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council (IGCC).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting (using either breather or capillary tubes) and sealing.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.7 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units whose hermetic seal has failed within specified warranty period indicated below.

Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass. Upon notification of such deterioration within the warranty period furnish replacement glass units for failed glass units at the convenience of the Owner.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Refer to the drawings for the extent of glass types and locations. Glass types indicated on the drawings are keyed to the Part 3 Glass Schedule Articles at the end of this section. The Contractor shall confirm the levels of heat treatment required for each glass type scheduled as contained in Articles Performance Requirements, Submittals and Quality Assurance.

2.2 PRIMARY FLOAT GLASS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

A. General: Heat treat glass where the need is determined by thermal stress analyses, by wind load analyses, and where required to meet safety glazing requirements.

B. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of installed glass unit.

C. Sizes and Cutting: Prior to heat treatment, cut glass to required sizes as determined by accurate measurement of openings to be glazed, making allowance for required edge clearances. Cut and process edges in accordance with glass manufacturer's recommendations. Do not cut or treat edges in the field.

D. Heat-Strengthened Glass: Provide glass complying with ASTM C1048 Kind HS. Surface compression range shall be between 4,000 psi (27.6 MPa) and 7,000 psi (48 MPa).

E. Fully Tempered Glass: Provide glass complying with ASTM C1048 Kind FT and meeting the requirements of ANSI Z97.1. Surface compression shall be equal to or greater than 10,000 psi (69 MPa). After tempering, heat soak 100 percent of all fabricated glass units to European Union Standard EN14179 to eliminate inclusion related glass breakage. Statistical heat soaking shall not be permitted.

F. Flatness Tolerances: All heat treated glass shall be fabricated to the following flatness tolerances:

1. Overall Bow and Warp: Not greater than the maximum bow and warp tolerances in any direction as listed in ASTM C1048 Table 2. Localized warp limited to 1/32 inch in 12 inches (0.79 mm in 304.8 mm).
2. Roll Ripple: The deviation from flatness at any peak (peak to valley deviation) shall not exceed 0.003 inches for 6 mm (0.0762 mm for 6 mm) thick glass.

2.4 COATED FLOAT GLASS

A. General: Provide coated glass complying with requirements indicated in this Article and in schedules at the end of Part 3.

1. Sputter-Coated Float Glass: Float glass with the coating(s) specified in schedules at the end of Part 3, deposited by magnetron sputtered vacuum deposition process after manufacture and heat treatment (if any). Pyrolytic, and wet chemical deposition, glass coatings will not be permitted.
2. Coating Quality: The allowable range of defects in coatings applied to glass shall be as accepted through glass sample submissions. Installed coated glass products which are outside of the accepted sample range shall be subject to rejection by the Architect. In order to reduce the possibility of glass rejection, the supplier of coated glass products shall provide glass coating production runs for the entire project from a single coating facility. The allowable range of defects are defined as follows:

    a. The vision glass area is defined as the field of glass which is greater than 3 inches (76 mm) from the glass unit edge.

        1) Pinholes: At an indoor viewing distance of 6 feet (1829 mm) for low emissivity coatings, and 15 feet (4572 mm) for reflective coatings:

            a) Pinholes greater than 1/16 inch (1.5 mm) in dia. shall not be permitted;
            b) Large clusters or close spacing of pinholes 1/16 inch (1.5 mm) and smaller shall not be permitted in the vision glass area; and
            c) Large clusters or close spacing of pinholes 1/16 inch (1.5 mm) and smaller may be permitted outside of the vision glass area subject to Architect's acceptance.

        2) Scratches: At an indoor viewing distance of 10 feet (3048 mm) for low emissivity coatings, and 15 feet (4572 mm) for reflective coatings:

            a) Scratches smaller than 3 inches (76 mm) long are allowed in any glass area;
            b) Scratches from 3 inches to 5 inches (76 mm to 127 mm) long are allowed only within 3 inches (76 mm) of an edge; and
            c) Scratches greater than 5 inches (127 mm) long shall not be permitted in the vision glass area.
            d) Concentrated scratches, scuffs, rub marks, cup marks or abraded areas shall not be permitted in any glass area.

        3) Reflectance and Transmission Inspection: When viewed outdoors against a bright uniform opaque background at a distance of 10 feet (3048 mm) for

low emissivity coatings (15 feet (4572 mm) for reflective coatings), color, reflectance and transmission will be permitted to have a slight variance subject to Architect's acceptance.

a) Mottling and streaking of the coating shall not be permitted.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Preassembled units, with dehydrated entrapped air, consisting of sheets of glass hermetically sealed at all edges with a polyisobutylene primary and a silicone secondary elastomeric sealant. The lites of glass shall be separated by dessicant containing aluminum spacers. All insulating glass units shall be IGCC certified to comply with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.

1. Provide Kind HS (heat-strengthened) float glass where needed to comply with "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.

2.6 GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Gasket, Blocking, and Spacer Wet Glazing Materials: Silicone, compatible with and adherent to each material it will be in contact with, as recommended by the manufacturer to fulfill performance requirements.

2.7 GLAZING GASKETS

A. Dense Compression Gaskets:

1. EPDM: Continuous extruded EPDM with cross sectional profile, physical properties, and tolerances as recommended by the window and curtain wall manufacturer, and as required, to comply with the performance requirements specified and shown all in compliance with the applicable provisions of ASTM C864, Option II.
2. Silicone: Continuous extruded silicone with cross sectional profile, physical properties, and tolerances as recommended by the window and curtain wall manufacturer, and as required, to comply with the performance requirements specified and shown all in compliance with the applicable provisions of ASTM C1115, Type C.
3. Any material indicated above.

B. Soft Compression Gaskets: Continuous extruded expanded foam with, cross sectional profile, physical properties, and tolerances as recommended by the window and curtain wall manufacturer, and as required, to comply with the performance requirements specified and shown all in compliance with the applicable provisions of ASTM C509, Option II, Type II; provide the following:

1. EPDM.
2. Silicone.
3. Any material indicated above.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces, and wet glazing materials, contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: EPDM complying with ASTM C864 (Option II), blocks, 85 +/- 5 Shore A durometer hardness, 1/16 inch (1.5-mm) less than the channel width, and length based on the square footage of the glass unit to be supported in accordance with GANA standards and glass manufacturer recommendations but not less than 4 inches (101.6 mm).

D. Edge Blocks: EPDM complying with ASTM C864 (Option II), blocks, 65 +/- 5 Shore A durometer hardness, minimum 4 inches (101.6 mm) long and sized to allow 1/8 inch (3.18 mm) clearance between edge of glass and block.

2.9 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

1. Edge and Surface Conditions: Comply with the recommendations of AAMA "Structural Properties of Glass" for "clean-cut" edges, except comply with manufacturer's recommendations when they are at variance therewith.

B. Cutting: Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option. For glass to be cut at site, provide glass 2 inches (50.8 mm) larger than required in both dimensions, so as to facilitate cutting of clean cut edges without the necessity of seaming or nipping. Do not cut, seam, nip or abrade heat-treated glass.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier and glass framing erector present, for compliance with the following:

1. Compliance with the specified manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing stops, glazing channels, and rabbets which will be in contact with the glazing materials immediately before glazing.

1. Remove coatings that might fail in adhesion or interfere with bond of sealants.
2. Comply with manufacturer's instructions for final wiping of surfaces immediately before application of primers.
3. Wipe metal surfaces with IPA (isopropyl alcohol) unless otherwise required by compatibility and adhesion testing results.

B. Prime surfaces to receive glazing compounds. When priming, comply with wet glazing manufacturer's recommendations.

C. Inspect each piece of glass immediately before installation. Do not install any pieces which are improperly sized or have damaged edges, scratches or abrasion or other evidence of damage. Remove labels from glass immediately after installation.

D. Seal vent (breather or capillary) tubes in insulating glass units in accordance with the insulating glass manufacturer's written recommendations.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

1. All glass units shall be installed in accordance with the glass manufacturer's recommendations.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to surfaces indicated to receive glazing materials. Use primers as determined by preconstruction compatibility and adhesion testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless more stringent requirements are recommended by glass manufacturer. Place blocks to allow water passage to weep holes.

1. For Glass Units Less Than 72 inches (1830 mm): Locate setting blocks at sill one-quarter of the width in from each end of the glass unless otherwise recommended by the glass manufacturer.
2. For Glass Units 72 inches (1830 mm) or Greater: Locate setting blocks at sill one-eighth of the width in from each end of the glass, but not less than 6 inches (150 mm), unless otherwise recommended by the glass manufacturer.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide edge blocking to prevent glass lites from moving sideways in glazing channel, sized and located to comply with the glass manufacturer's recommendations and the requirements in referenced glazing publications.

H. Set glass lites with uniform pattern, draw, bow, and similar characteristics, producing the greatest possible degree of uniformity in appearance on the entire exterior wall elevation.

1. Set glass units with void between edge of units and glazing channel.
2. Orient and install insulating glass units made up with one light of low emissivity coated glass with the uncoated glass light on the inboard (building) side.

I. Where wedge-shaped gaskets are driven into one side of channel to pressurize gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

J. Miter cut gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away and join with sealant recommended by gasket manufacturer which will provide an airtight and watertight seal at the joint.

3.4 PROTECTION AND CLEANING

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way and from any source, including natural causes, accidents, and vandalism.

D. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.5 MONOLITHIC FLOAT-GLASS SCHEDULE

A. Uncoated Clear Float Glass: Where glass as designated below is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:

1. Uncoated Clear Fully Tempered Float Glass: Kind FT (fully tempered).

3.6 INSULATING-GLASS SCHEDULE

A. Low-E Insulating Glass: Where glass of this designation is indicated, provide low-emissivity insulating-glass units complying with the following:

1. Products: Provide one of the following:

    a. Viracon VE 1-85
    b. Guardian SuperNeutral 68(#2)

2. Overall Unit Thickness and Thickness of Each Lite: 25 and 6 mm
3. Interspace Content: Air.
4. Indoor Lite: Type I (transparent glass, flat), Class 1 (clear) float glass.

    a. Kind HS (heat strengthened), Condition C (other coated glass).

5. Outdoor Lite: Type I (transparent glass, flat) float glass.

    a. Class 1 (clear).
    b. Kind HS (heat strengthened), Condition A (uncoated surfaces).

6. Low-Emissivity Coating: Sputtered on second surface.
7. Visible Light Transmittance: 68-76 percent
8. Winter Nighttime U-Value: 0.31-0.29
9. Summer Daytime U-Value: 0.29-0.28
10. Solar Heat Gain Coefficient: 0.54-0.38
11. Outdoor Visible Reflectance: 11-12 percent

END OF SECTION 08 80 00

SECTION 08 83 00 – MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mirrored glass with vinyl-backing safety film.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

C. Samples: As follows:

1. Mirrored Glass: 12 inches (300 mm) square, including safety backing and edge treatment on 2 adjoining edges.
2. Mirror clips.
3. Mirror Trim: 12 inches (300 mm) long.

D. Qualification Data: For Installer.

E. Product certificates.

F. Preconstruction Test Report: For mirror mastic compatibility.

G. Warranty: Special warranty specified in this Section.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).

B. Glazing Publications: Comply with published recommendations in GANA's "Glazing Manual," unless more stringent requirements are indicated.

C. NAAMM's Publication: For silvered mirrored glass, comply with recommendations in NAAMM's "Mirrors, Handle with Extreme Care, Tips for the Professional on the Care and Handling of Mirrors."

D. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.

E. Preconstruction Compatibility Test: Submit mirror mastic products to organic protective coating manufacturer for testing to determine compatibility of adhesive with mirrored glass coating.

1.4 DELIVERY, STORAGE, AND HANDLING

A. For silvered mirrored glass, comply with mirrored glass manufacturer's written instructions for shipping, storing, and handling mirrored glass as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrored glass units that deteriorate f.o.b. the nearest shipping point to Project site, within five years from date of Substantial Completion.

1. Deterioration of Silvered Mirrored Glass: Defects developed from normal use not caused by maintaining and cleaning mirrored glass contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 MIRRORED GLASS

A. Silvered Mirrored Glass:

1. Glass Mirrors: ASTM C 15032, manufacturing copper-free low-lead mirror coating process.

a. Clear: Class 1 (clear), Quality q2 (mirror glazing quality), ultra-clear (low-iron) float glass with a minimum 91 percent visible light transmission.

1) Thickness: As required to meet sizes indicated.

2. Silvering: Successive layers of chemically deposited silver, electrically or chemically deposited copper, and manufacturer's standard organic protective coating applied to second glass surface to produce coating system complying with FS DD-M-411.

B. Fabrication:

1. Cutouts: Fabricate cutouts for notches and holes in mirrored glass without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrored glass.
2. Mirrored Glass Edge Treatment: Rounded polished.

a. Silvered Mirror Glass: Seal edges after edge treatment to prevent chemical or atmospheric penetration of glass coating.
b. Factory Fabricate: Perform edge treatment and sealing in factory immediately after cutting to final sizes.

C. Vinyl-Backed Safety Mirrored Glass: Apply vinyl backing with pressure-sensitive adhesive coating over glass coating as recommended by vinyl-backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections. Use adhesives and vinyl backing compatible with mirrored glass as certified by organic coating manufacturer.

2.3 MISCELLANEOUS MATERIALS

A. Setting Blocks: Neoprene, 70 to 90 Shore A hardness.

B. Edge Sealer: Coating compatible with glass coating and approved by mirrored glass manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrored glass by spot application and not containing asbestos.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Qwikset Mirror Mastic by Palmer Products Corporation.
b. UltraBond by Gunther Mirror Mastics.

D. Stainless Steel Top and Bottom Trim: J-channels with return that produces glazing channel to accommodate mirrored glass thickness indicated.

1. Bottom and Top Trim: J-channels formed with front leg and back leg not less than 5/16 and 7/8 inch (8 and 22 mm) in height, respectively.

a. Product:

1) C. R. Laurence Co., Inc.; CRL Stainless Steel "J" Channel, No. SS960.

E. Fasteners: Fabricated of same basic metal and alloy as fastened metal.

F. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.

B. Install mirrored glass units to comply with written instructions of mirrored glass manufacturer and with referenced GANA and NAAMM publications. Mount mirrored glass accurately in place in a manner that avoids distorting reflected images.

C. Provide space for air circulation between back of mirrored glass units and face of mounting surface.

D. Mastic Spot Installation System:

1. Apply barrier coat to mirrored glass backing where approved in writing by manufacturers of mirrored glass and backing material.
2. Apply mastic in spots to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrored glass units and face of mounting surface.
3. After mastic is applied, align mirrored glass units and press into place while maintaining a minimum air space of 1/8 inch (3 mm) between back of mirrored glass and mounting surface.

E. For wall-mounted mirrored glass units, install permanent means of support at bottom and top edges with bottom support designed to withstand mirrored glass weight and top support designed to prevent mirrored glass from coming away from wall along top edges.

1. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrored glass units.
2. For continuous bottom supports, provide setting blocks 1/8 inch (2 mm) thick by 4 inches (100 mm) long at quarter points. For channels or other continuous supports in which water could be trapped, provide, between setting blocks, two slotted weeps not less than 1/4 inch (3 mm) wide by 3/8 inch (4.5 mm) long.
3. Where indicated, install bottom and top trim. Fabricate trim in single lengths to fit and cover top and bottom edges of mirrored glass units.

F. Protect mirrored glass from breakage and contaminating substances resulting from construction operations.

1. Do not permit edges of silvered mirrored glass to be exposed to standing water.

2. Maintain environmental conditions that will prevent silvered mirrored glass from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 08 83 00

SECTION 09 22 16 – NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes non-load-bearing steel framing members for the following applications:

1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by a testing and inspection agency.

B. Sound Transmission Characteristics: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspection agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

A. Recycled Content of Steel Products: Provide products with average recycled content of steel products such that post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

B. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized, unless otherwise indicated.

2.2 SUSPENSION SYSTEM COMPONENTS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.

B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.

C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.

D. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges, 3/4 inch (19.1 mm) deep.
2. Steel Studs: ASTM C 645.

a. Minimum Base-Metal Thickness: As indicated on Drawings.
b. Depth: As indicated on Drawings.

3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep.

a. Minimum Base Metal Thickness: As indicated on Drawings.

4. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep members designed to reduce sound transmission.

a. Configuration: Hat shaped.

E. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Armstrong World Industries, Inc.; Drywall Grid Systems.
b. Chicago Metallic Corporation; 640-C or 660-C Drywall Furring System.
c. USG Corporation; Drywall Suspension System.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Steel Studs and Runners: ASTM C 645.

1. Minimum Base-Metal Thickness: As indicated on Drawings.
2. Depth: As indicated on Drawings.

B. Slip-Type Head Joints: Where indicated, provide the following:

1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.

2) Superior Metal Trim; Superior Flex Track System (SFT).

C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: As indicated on Drawings.

D. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.

E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: As indicated on Drawings.
2. Depth: As indicated on Drawings.

F. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical or hat shaped.

G. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch (0.79 mm).
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.

2.4 AUXILIARY MATERIALS

A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 INSTALLING SUSPENSION SYSTEMS

A. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

B. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Do not attach hangers to steel roof deck.
4. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
6. Do not connect or suspend steel framing from ducts, pipes, or conduit.

C. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs as follows:

a. Single-Layer Application: 16 inches (406 mm) o.c., unless otherwise indicated.
b. Multilayer Application: 16 inches (406 mm) o.c., unless otherwise indicated.
c. Tile backing panels: 16 inches (406 mm) o.c., unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb, unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Direct Furring:

1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 09 22 16

SECTION 09 29 00 – GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum wallboard.
2. Tile backing panels.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

C. Mockups: Before finishing gypsum board assemblies, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and qualities of materials and execution.

1. Install mockups for the following applications:

a. Surfaces indicated to receive nontextured paint finishes.
b. Ceiling surfaces indicated to receive textured paint finishes.

2. Simulate finished lighting conditions for review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 STEEL FRAMING

A. See Division 09 Section "Non-Structural Steel Framing."

2.3 PANELS, GENERAL

A. Recycled Content: Provide gypsum panel products with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 20 percent by weight.

2.4 PANEL PRODUCTS

A. Manufacturers:

1. BPB Gypsum.
2. G-P Gypsum Corporation.
3. National Gypsum Company
4. Temple-Inland Forest Products Corp.
5. USG Corporation, Inc.

B. Panel Size, General: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.

C. Gypsum Wallboard: ASTM C 1396.

1. Type X: In thickness indicated and with long edges tapered.

D. Sag-Resistant Gypsum Wallboard: ASTM C 1396, manufactured to have more sag resistance than regular-type gypsum board, 1/2 inch (12.7 mm) thick, and with long edges tapered. Provide panels of 12-foot lengths.

E. Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with core type and in thickness indicated.

a. Product: G-P Gypsum Corp.; Dens-Shield Tile Backer.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Cornerbead: Use at outside corners, unless otherwise indicated.

2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.
4. U-Bead: Use where indicated.
5. Expansion (Control) Joint: Use where indicated.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Available Manufacturers: Subject to compliance with profiles and designations indicated on Drawings, provide products by one of the following:

   a. Fry Reglet Corp.; As indicated by designation on Drawings.
   b. Gordon, Inc.; As indicated by designation on Drawings.
   c. Pittcon Industries; As indicated by designation on Drawings.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), alloy 6063-T5.
3. Finish: 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 611.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475.

B. Joint Tape:

1. Interior Gypsum Wallboard over Metal Studs: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, flanges of trim accessories, and fasteners, use setting-type taping compound.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by manufacturer.
2. Cementitious Backer Units: As recommended by manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

C. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products:

a. OSI Sealants, Inc.; Pro-Series, SC 175 Acoustical Sound Sealant Non-Flammable - Latex.
b. Pecora Corporation; AC-20 + Silicone.
c. Tremco, Incorporated; Tremflex 834.
d. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

D. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

E. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
2. Recycled Content: Provide blankets with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 15 percent by weight.

F. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PANEL PRODUCT INSTALLATION

A. Gypsum Board: Comply with ASTM C 840 and GA-216.

1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.
2. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.
3. On ceilings, apply sag-resistant gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
4. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
5. Multilayer Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.
6. Laminating to Substrate: Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

B. Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.

3.2 FINISHING

A. Installing Trim Accessories: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Finishing Gypsum Board Panels: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

1. Prefill open joints and damaged surface areas.
2. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
3. Glass-Mat, Water-Resistant Backing Panels: Do not use paper tape and joint compound. Finish according to manufacturer's written instructions.
4. Cementitious Backer Units: Finish according to manufacturer's written instructions.

C. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:

1. Level 1: Embed tape at joints in 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.
2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where panels are substrate for tile and where indicated.
3. Level 3: Embed tape and apply separate first and fill coats of joint compound to tape, fasteners, and trim flanges where indicated.
4. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.

END OF SECTION 09 29 00

SECTION 09 30 00 – TILING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Glazed wall tile.
2. Glass mosaic wall tile.
3. Joint sealants installed as part of tile installations.

B. Related Sections include the following:

1. Division 09 Section "Gypsum Board" for tile backing panels.

1.2 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.
2. Step Treads: Minimum 0.6.
3. Ramp Surfaces: Minimum 0.8.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints.

C. Samples:

1. Each type, composition, color, and finish of tile.
2. Assembled samples with grouted joints for each color grout and for each type, composition, color, and finish of tile.
3. For each color of joint sealant.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.

1. Build mockup of each type of wall tile installation.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 5 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide the products specified.

2.2 TILE PRODUCTS

A. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

B. Unglazed Ceramic Mosaic Tile: Factory-mounted flat tile, as scheduled on drawings.

C. Glazed Ceramic Mosaic Tile: Factory-mounted flat tile, as scheduled on drawings.

D. Glazed Wall Tile , as scheduled on drawings.

E. Glass Mosaic Wall Tile , as scheduled on drawings.

2.3 SETTING AND GROUTING MATERIALS

A. Source Limitations: For each tile installation, obtain compatible formulations of setting and grouting materials containing latex or latex additives from a single manufacturer.

B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Prepackaged dry-mortar mix combined with liquid-latex additive.
2. For wall applications, provide nonsagging mortar.

C. Water-Cleanable, Tile-Setting Epoxy Adhesive (at glass mosaic tile): ANSI A118.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.
b. Laticrete International, Inc.
c. MAPEI Corporation.
d. Texas Cement Products, Inc.

2. Color: White.

3. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by manufacturer for intended use.

D. Chemical-Resistant, Water-Cleanable, Epoxy Grout: ANSI A118.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.
b. Laticrete International, Inc.
c. MAPEI Corporation.
d. Texas Cement Products, Inc.

2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by manufacturer for intended use.
3. Colors: As selected from manufacturer's full range.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 07 Section "Joint Sealants."

1. VOC Content: Not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. One-Part, Mildew-Resistant Silicone: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for in-service exposures of high humidity and extreme temperatures.

a. Products:

1) Dow Corning Corporation; Dow Corning 786.
2) GE Silicones; Sanitary 1700.
3) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
4) Tremco, Inc.; Tremsil 600 White.
5) Laticrete Latasil color-matched to grout selection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Substrate:

1. All walls to receive glass mosaic tile installation should have a maximum variation of less than ¼ inch in 10'-0" (6mm in 3m), and no more than 1/16" in 1' (1.5mm in 0.3m) variation from substrate high points.
2. All surfaces to receive glass mosaic tile installation should meet minimum deflection standards of 1/360 of the span under all concentrated or distributed live and dead loads.
3. New concrete substrates shall be cured a minimum of 28 days at 70°F (21°C), including an initial (7) day period of wet curing
4. Surface temperature must be between 40-90°F (4-32°C)

B. Surface Prep: To correct unacceptable variations in the substrate, use a modified 2 part leveling compound.. Finish with a flat trowel. Allow leveling compound to cure fully per manufacturer's instructions prior to the installation of glass tile.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.

C. Remove protrusions, bumps, and ridges by sanding or grinding.

D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

E. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCNA Installation Guidelines: TCNA's "Handbook for Ceramic Tile Installation." Comply with TCNA installation methods indicated in ceramic tile installation schedules.

C. Comply with "Installation of Paper-Faced, Back-Mounted, Edge Mounted, or Clear Film Face-Mounted Glass Mosaic Tile," ANSI A108.16-2005.

D. Ambient Temperature of substrate and glass product must be maintained per manufacturer's recommendations for optimum curing of mortar and maximum bond to glass tile.

E. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

G. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

H. Movement Joints: Locate movement joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

I. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated. For back-mounted and clear film face-mounted glass mosaic tile, allow the setting material to harden for 24 hours minimum (vertical installation) and 48 hours minimum (horizontal installation) prior to cleaning tile face and then grouting.

1. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

J. Install tile on walls with the following joint widths:

1. Ceramic Mosaic Tile: 1/16 inch (1.6 mm).
2. Glazed Wall Tile: 1/16 inch (1.6 mm).
3. Glass Mosaic Tile: manufacturer recommended joint widths.

3.4 WALL TILE INSTALLATION SCHEDULE

A. Interior wall installation over glass-mat, water-resistant backer board; thin-set mortar; TCNA W245.

1. Thin-Set Mortar: Latex- portland cement mortar.
2. Grout: epoxy grout.

B. Interior wall installation (glass mosaic tile) over glass-mat, water-resistant backer board or gypsum board.

1. Epoxy adhesive.
2. Grout: epoxy grout.

END OF SECTION 09 30 00

SECTION 09 51 13 – ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes acoustical panels, waterproof ceiling panels and exposed suspension systems for ceilings.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Coordination Drawings: Drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Ceiling suspension assembly members.
2. Method of attaching hangers to building structure.
3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

C. Samples: For each acoustical panel, for each exposed suspension system member, and for each color and texture required.

D. Product test reports.

E. Research/evaluation reports.

F. Maintenance data.

1.3 QUALITY ASSURANCE

A. Acoustical Testing Agency Qualifications: An independent testing laboratory or an NVLAP-accredited laboratory.

B. Fire-Test-Response Characteristics:

1. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class A materials, when tested per ASTM E 84.

a. Smoke-Developed Index: 450 or less.

1.4 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size units equal to 3.0 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to 3.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 GENERAL

A. Metal Suspension System Standard: Comply with ASTM C 635.

1. Recycled Content: Provide products made from steel sheet with average recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

B. Acoustical Panel Standard: Comply with ASTM E 1264.

C. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

1. 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.

D. 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, finish, and color as that used for exposed flanges of suspension system runners.

2.3 ACOUSTICAL PANELS

A. Products: Subject to compliance with requirements, provide the following:

1. Armstrong World Industries, Inc.; Optima Open Plan," Item No. 3254.

B. Color: white

C. LR: 0.90

D. NRC: 1.00

E. AC: not applicable

F. Edge Detail: square tegular, reveal sized to fit flange of exposed suspension system members.

G. Thickness: 1 1/2 inch.

H. Size: 24 by 24 inches (610 by 610 mm).

2.4 WATERPROOF CEILING PANELS

A. Products: Subject to compliance with requirements, provide the following:

1. Parkland Plastics, Inc.; Spectra Tile Waterproof Ceiling Tiles

a. Color: As selected from manufacturer's full range.
b. Texture: As selected from manufacturer's full range.
c. Thickness: 4 mm.
d. Size: 24 by 24 inches (610 by 610 mm).

2.5 METAL SUSPENSION SYSTEM FOR WATERPROOF PANELS

A. Products:

1. Basis of Design: Provide Chicago Metallic; 660-C Exposed System, or equivalent system by one of the following:

a. Armstrong World Industries, Inc.
b. USG Corporation

2.6 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANELS

A. Products:

1. Basis of Design: Provide Chicago Metallic; Ultraline 3500, or equivalent system by one of the following:

a. Armstrong World Industries, Inc.
b. USG Corporation

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install panel ceilings to comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. 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 tiles at borders.

C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate with concealed fasteners 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 (3.2 mm in 3.66 m). Miter corners accurately and connect securely.

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 fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

END OF SECTION 09 51 13

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete Masonry Units
2. Structural Steel & Metal Fabrications
3. Galvanized Metal
4. Ferrous Metals

B. Related Sections include the following:

1. Division 03 Section for Concrete Horizontal Surface Finishing.
2. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
3. Division 08 Sections for factory priming doors and frames with primers specified in this Section.
4. Division 09 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

1.2 DEFINITIONS

A. Light Absorption Value: Percentage of light absorbed by a finish.

B. Light Reflectance Value (LRV): Percentage of light reflected by a finish.

C. Gloss Sheen Ratings of applied dry paint at 60 degrees and at 85 degrees:

1. Flat or Matte finish: 0 – 5; 10 max.
2. Velvet finish: 0 – 10; 10 – 35
3. Eggshell finish: 10 – 25; 10 – 35
4. Satin finish: 20 – 35; 35 min.
5. Semi-Gloss finish: 35 – 70

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of topcoat product indicated.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.4 QUALITY ASSURANCE

A. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on benchmark samples.

a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. ICI Paints.
3. PPG Architectural Finishes, Inc.
4. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.3 FILLERS (BLOCK AND TEXTURED SURFACE)

A. Latex Block Filler:

1. Benjamin Moore & Co.:

a. One Coat Super Craft® Latex Block Filler 285 (48 g/L VOC).
b. One Coat Super Spec® Latex Block Filler 160 (13 g/L VOC).

2. ICI Paints:

a. One Coat 4000 BLOXFIL 4000 Interior/Exterior Heavy Duty Acrylic Block Filler (15.5-32 mils wet, 7-14.5 mils dry); (Solids: 45% vol & xx % wt, 67 g/L VOC).
b. One Coat 3010-1200 PREP & PRIME® BLOCK FILLER Interior/Exterior One Coat: Masonry Water-Based Primer (Solids: 51 % vol & 71 % wt, 61 g/L VOC).

3. PPG Architectural Finishes, Inc.:

a. One Coat 6-7 SPEEDHIDE® Interior/ Exterior Masonry Latex Block Filler (14 g/L VOC); (4.8 to 14.0 mils dry).
b. One Coat 6-12 SPEEDHIDE® Interior/ Exterior Masonry Latex Block Filler (26 g/L VOC)
c. One Coat 6-15 SPEEDHIDE® Int./Ext. Acrylic Masonry Block Filler (48 g/L VOC), (7.0 milsdry).

4. Sherwin-Williams Company (The):

a. One Coat B25W42 Block Filler (8 mils dry).
b. One Coat S-W PrepRite Block Filler, B25W25 (16 mils wet, 8 mils dry).

2.4 PRIMERS

1. Masonry - Concrete Block (CMU):

a. Benjamin Moore & Co.:
b. ICI Paints:

1) One Coat 4000 BLOXFIL 4000 Interior/Exterior Heavy Duty Acrylic Block Filler (15.5-32 mils wet, 7-14.5 mils dry); (Solids: 45% vol & xx % wt, 67 g/L VOC).
2) One Coat 3010 PREP & PRIM$^{E®}$ BLOCK FILLER Interior/Exterior One Coat: Masonry Water-Based Primer (Solids: 51 % vol & 71 % wt, 61 g/L VOC).

c. PPG Architectural Finishes, Inc.:
d. Sherwin-Williams Company (The):

B. Metal Primers:

1. General Use:

a. Benjamin Moore & Co.:

1) One Coat 363 IronClad® Latex Low Lustre Metal & Wood Enamel (xx g/L VOC).
2) One Coat C163 IronClad® Alkyd Low Lustre Metal & Wood Enamel (380 g/L VOC).
3) One Coat P04 Super Spec® HP Acrylic Metal Primer (54 g/L VOC).
4) One Coat P06 Super Spec® HP Alkyd Metal Primer (323 g/L VOC).
5) One Coat P07 Super Spec® HP Universal Alkyd Metal Primer (340 g/L VOC).
6) One Coat P33 Super Spec® HP Polyamide Epoxy Metal Primer (339 g/L VOC).
7) One Coat Z06 Super Spec® Alkyd Metal Primer (325 g/L VOC).
8) One Coat Z07 Super Spec® Universal Alkyd Metal Primer (339 g/L VOC).

b. PPG Architectural Finishes, Inc.:

1) 6-208 (Red) SPEEDHIDE® Exterior Rust Inhibitive Steel Primer (330 g/L VOC).
2) 6-212 (White) SPEEDHIDE® Exterior Rust Inhibitive Steel Primer (330 g/L VOC).
3) 94-258 Series MULTIPRIME® Fast Dry 2.8 VOC Universal Primer (331 g/L VOC).

2. Galvanized Steel:

a. Benjamin Moore & Co.:
b. ICI Paints:

1) One Coat 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (5-8 mils wet, 2.2-3.5 mils dry); (Solids: 44 % vol & xx % wt, 91 g/L VOC).
2) One Coat 4160 DEVGUARD 4160 Multi-Purpose Tank & Structural Primer (Solids: xx % vol & xx % wt, xx g/L VOC).

c. PPG Architectural Finishes, Inc.: One Coat Pitt-Tech Interior/Exterior DTM Primer/Finish 90-712 Series (2.0-3.0 mils DFT).
d. Sherwin-Williams Company (The):

1) Two Coats S-W A-100 Exterior Latex Gloss, A8W10051 Series (4 mils wet, 1.3 mils dry per coat).
2) Two Coats S-W Metalatex Acrylic Semi-Gloss, B42 Series (4 mils wet, 1.5 mils dry per coat).
3) Two Coats S-W A-100 Exterior Latex Satin, B82 Series (4 mils wet, 1.4 mils dry per coat).
4) Two Coats S-W A-100 Exterior Latex Flat, A6 Series (4 mils wet, 1.4 mils dry per coat).

3. Metal - Structural Iron and Ferrous Steel:

a. Benjamin Moore & Co.:
b. ICI Paints: One Coat Acrylic High Performance (Low UV/Abrasion): One Coat: 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (5-8 mils wet, 2.2-3.5 mils dry); (Solids: 44 % vol & xx % wt, 91 g/L VOC).
c. PPG Architectural Finishes, Inc.:

1) One Coat Pitt-Tech Interior/Exterior DTM Primer/Finish 90-712 Series (2.0-3.0 mils DFT).
2) One Coat Speedhide Interior/Exterior Alkyd Rust Inhibitive Steel Primers 6-208, 6-212 (1.5-2.0 mils DFT).

d. Sherwin-Williams Company (The): One Coat B66W1 DTM Primer Finish & Flat Finish (5-10 mils wet); (2-5 mils dry); (Solids: 46% <150 g/L VOC).

4. Metal - Miscellaneous Ferrous Steel:

a. Benjamin Moore & Co.:
b. ICI Paints: Semi-Gloss / Gloss Paint Finish:

1) One Coat Acrylic High Performance (Low UV/Abrasion): One Coat: 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (5-8 mils wet, 2.2-3.5 mils dry); (Solids: 44 % vol & xx % wt, 91 g/L VOC).
2) One Coat Solvent-Based Alkyd High Performance (Low UV/Abrasion): One Coat 4160 DEVGUARD 4160 Multi-Purpose Tank & Structural Primer (Solids: xx % vol & xx % wt, xx g/L VOC).

c. PPG Architectural Finishes, Inc.:

1) One Coat Pitt-Tech Interior/Exterior DTM Primer/Finish 90-712 Series (2.0-3.0 mils DFT).
2) One Coat Speedhide Interior/Exterior Alkyd Rust Inhibitive Steel Primers 6-208, 6-212 (1.5-2.0 mils DFT).

d. Sherwin-Williams Company (The): One Coat B66W1 DTM Primer Finish & Flat Finish (5-10 mils wet); (2-5 mils dry); (Solids: 46% <150 g/L VOC).

5. Alkyd, Anticorrosive Metal Primer:

a. Benjamin Moore & Co.:
b. ICI Paints: One Coat 4160 DEVGUARD 4160 Multi-Purpose Tank & Structural Primer (Solids: xx % vol & xx % wt, 311 g/L VOC).
c. PPG Architectural Finishes, Inc.: One Coat Speedhide Interior/Exterior Alkyd Rust Inhibitive Steel Primers 6-208, 6-212 (1.5-2.0 mils DFT).
d. Sherwin-Williams Company (The): One Coat S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry).

6. Quick-Drying Alkyd Metal Primer:

a. Benjamin Moore & Co.:
b. ICI Paints:

1) Two Coats 4160 DEVGUARD 4160 Multi-Purpose Tank & Structural Primer (Solids: xx % vol & xx % wt, xx g/L VOC).
2) Two Coats 4180 DEVGUARD Quick Dry Universal Primer (Solids: xx % vol & xx % wt, 336 g/L VOC).

c. PPG Architectural Finishes, Inc.: One Coat Multi-Prime Fast Dry 2.8 VOC Primer 94-258 Series (1.5-2.0 mils DFT).
d. Sherwin-Williams Company (The): One Coat S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry).

C. Universal Primers:

1. Benjamin Moore & Co.:

a. One Coat 023 Fresh Start® All-Purpose 100% Acrylic Primer (100 g/L VOC).
b. One Coat 024 Fresh Start® All-Purpose Alkyd Primer (350 g/L VOC).
c. One Coat W024 Fresh Start® All-Purpose Alkyd Primer (350 g/L VOC).
d. One Coat 100 Fresh Start® Moorwhite® Penetrating Alkyd Primer (350 g/L VOC).
e. One Coat 169 Super Spec® Latex Exterior Primer (200 g/L VOC).

f. One Coat 521 AURA® Interior/Exterior Color Foundation (49 g/L VOC).

2. ICI Paints:

a. 3210 PREP & PRIME® GRPPER® MULTI-PURPOSE Interior/Exterior Water-Based Primer Sealer (Solids: 48 % vol & 61 % wt, 99 g/L VOC).
b. One Coat 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (Solids: (5-8 mils wet, 2.2-3.5 mils dry); (Solids: 44 % vol & xx % wt, 91 g/L VOC).
c. One coat: 6001 PREP & PRIME HYDROSEALER Waterborne Multi Purpose Primer Sealer (Solids: 35 % vol & 47 % wt, 87 g/L VOC).

3. PPG Architectural Finishes, Inc.: One Coat PPG Seal-Grip Interior/Exterior 100% Acrylic Universal Primer/Sealer 17-921 Series (1.5 mils DFT).
4. Sherwin-Williams Company (The): One Coat S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry).

2.5 FINISH COAT

A. Exterior Latex Paints:

1. Exterior Latex (Eggshell):

a. Benjamin Moore & Co.:

1) 634 AURA® Exterior Paint Low Lustre Finish (44 g/L VOC).
2) 184 Super Spec® 100% Acrylic Exterior Satin (150 g/L VOC).
3) 363 IronClad® Latex Low Lustre Metal & Wood Enamel (380 g/L VOC).
4) 172 Super Spec® Satin-Fil® (160 g/L VOC).

b. ICI Paints:

1) Two Coats 6403 DULUX FORTIS Premium 100% Acrylic Satin Exterior Enamel (Solids: 39% vol& 51% wt, 149 g/L VOC).
2) Two Coats 2402 DULUX PROFESSIONAL Exterior 100% Acrylic Satin Finish (Solids: 34 % vol & 49 % wt, 150 g/L VOC).
3) Two Coats 2412 ULTRA HIDE DURUS Exterior Satin (Solids: xx % vol & xx % wt, xx g/L VOC).

c. PPG Architectural Finishes, Inc.:

1) 79-45 Series MANOR HALL® Exterior Premium Eggshell Acrylic Latex (144 g/L VOC).
2) 6-2045 Series SPEEDHIDE® Exterior Satin 100% Acrylic Latex (104 g/L).
3) 10-1410 Series Pitt-Cryl® PLUS Exterior Wood and Stucco Satin 100% Acrylic Latex (114 g/L VOC).
4) 71-45 Series Exterior Metal & Vinyl Siding Refinish Eggshell (144 g/L VOC).
5) 73-410 Series MANOR HALL® Exterior Satin Acrylic Latex (109 g/L VOC).

d. Sherwin-Williams Company (The):

1) Two Coats S-W A-100 Exterior Latex Satin, A82 Series (4 mils set, 1.4 mils dry per coat).
2) Two Coats S-W Resilience Latex Satin, K43 Series (4 mils wet, 1.44 mils dry per coat).

B. Exterior Alkyd Paints:

1. Exterior Alkyd Enamel (Eggshell / Satin):

a. ICI Paints:

1) 2516 Ultra-Hide Durus Exterior Alkyd Semi-Gloss Finish (370g/L VOC).

b. Benjamin Moore & Co.:

1) C163 IronClad® Alkyd Low Lustre Metal & Wood Enamel (380 g/L VOC).
2) Z235 Satin Impervo® Finish Enamel (365 g/L VOC).
3) Z163 Super Spec® D.T.M. Alkyd Low Lustre Enamel (397 g/L VOC).

c. Sherwin-Williams Company (The): DTM Alkyd Enamel B55 Series (>450 g/L VOC).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Masonry (Clay and CMU): 12 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Fiber-cement Siding Substrates:

1. Latex System:

a. Prime Coat: not required (factory primed).
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex semigloss.

B. CMU Substrates:

1. Latex System:

a. Prime Coat: Interior/exterior latex block filler.
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex semigloss.

C. Steel Substrates:

1. Alkyd System:

a. Prime Coat: Alkyd anticorrosive metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Exterior alkyd enamel semigloss.

D. Galvanized-Metal Substrates:

1. Alkyd System:

a. Prime Coat: Cementitious galvanized-metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Exterior alkyd enamel semigloss.

END OF SECTION 09 91 13

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Steel.
2. Galvanized metal.
3. Aluminum (not anodized or otherwise coated).
4. Wood.
5. Gypsum board.

1.2 DEFINITIONS

A. Light Absorption Value: Percentage of light absorbed by a finish.

B. Light Reflectance Value (LRV): Percentage of light reflected by a finish.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each finish and for each color and texture required.

1.4 QUALITY ASSURANCE

A. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

    a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
    b. Other Items: Architect will designate items or areas required.

2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
3. Final approval of color selections will be based on benchmark samples.

    a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

4. Benchmark samples may be incorporated into the Work if undisturbed at time of Substantial Completion.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.2 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 Articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 Articles:

1. Benjamin Moore & Co. (Benjamin Moore).
2. ICI Paints (ICI).
3. PPG Industries, Inc. (Pittsburgh Paints).
4. Sherwin-Williams Co. (Sherwin-Williams).

2.3 INTERIOR PRIMERS

A. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Benjamin Moore; Aura Interior/Exterior Color Foundation, 521 (47.9 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.
2. ICI:

a. 3210 PREP & PRIME GRIPPER Multi-Purpose Primer (<100 g/L VOC).
b. 1030 PREP & PRIME PVA Wall Primer (<100 g/L VOC).
c. LM9116 PREP & PRIME Odor-Less Primer-Sealer (0 g/L VOC).

3. Pittsburgh Paints; 6-2 Speed Hide Interior Latex Sealer Quick Drying (98 g/L VOC): Applied at a dry film thickness of not less than 1.0 mils.
4. Sherwin-Williams; ProGreen 200 Latex Wall Primer B28W600 Series (<50 g/L VOC): Applied at a dry film thickness of not less than 1.5 mils.

B. Interior Wood Primer for Acrylic-Enamel and Semigloss Finishes: Factory-formulated acrylic-latex-based interior wood primer.

1. ICI:

a. 1020 PREP & PRIME Wall & Woodwork Acrylic Primer (<140 g/L VOC).
b. LM9116 PREP & PRIME Odor-Less Primer-Sealer (0 g/L VOC).
c. 3210 PREP & PRIME GRIPPER Multi-Purpose Primer (<100 g/L VOC).

2. Sherwin-Williams; PrepRite ProBlock Primer B28W101 Series (<100 g/L VOC): Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

C. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive metal primer.

1. Benjamin Moore; DTM Acrylic Metal Primer #M04 (51 g/L VOC): Applied at a dry film thickness of not less than 1.5 mils.
2. ICI:

a. 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (<85 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.

3. Pittsburgh Paints:

a. 90-912 Pitt-Tech Plus Interior/Exterior Primer Finish DTM Industrial Enamel (<99 g/L VOC corrosion protection): Applied at a dry film thickness of not less than 2.0 mils.

4. Sherwin-Williams;Pro-Cryl Universal Primer B66-310 (<100 g/L VOC): Applied at a dry film thickness of not less than 2.0 to 4.0 mils.

D. Interior Zinc Coated Metal Primer: Factory formulated galvanized metal primer.

1. Benjamin Moore; DTM Acrylic Metal Primer #P04 (51 g/L): Applied at a dry film thickness of not less than 1.5 mils.
ICI: Devflex 4020PF DTM Flat,/Interior/Exterior Direct to Metal Water Borne Primer: (< g/L VOC): Applied at a dry film thickness of 2.2 to 3.5 mils.
2. Pittsburgh Paints; 90-912 Pitt-TechPlus Interior/Exterior Primer/Finish DTM Enamel (<99 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.
3. Sherwin Williams: DTM Acrylic Primer Finish B66W1; (<150 g/L VOC): Applied at a dry film thickness of not less than 2.5 mils.

E. Interior Metal – Galvanized Metal Primer:

1. Benjamin Moore: Benjamin Moore; DTM Acrylic Metal Primer #P04 (51 g/L): Applied at a dry film thickness of not less than 1.5 mils.
2. ICI:

    a. 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (<91 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.
3. Pittsburgh Paints: Pittsburgh Paints; 90-912 Pitt-Tech Plus Interior/Exterior Primer/Finish DTM Enamel (<99 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.
4. Sherwin Williams: DTM Acrylic Primer Finish B66W1; (<150 g/L VOC): Applied at a dry film thickness of not less than 2.5 mils.

F. Interior Metal – Aluminum:

1. ICI:

    a. 4020 DEVFLEX 4020PF Direct to Metal Primer & Flat Finish (<91 g/L VOC): Applied at a dry film thickness of not less than 2.0 mils.

2.4 INTERIOR FINISH COATS

A. Interior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for interior application.

1. Benjamin Moore:

    a. Aura Waterborne Interior Matte Finish, 522 (<100 g/L VOC): Applied at a dry film thickness of not less than 1.9 mils.

2. ICI:

    a. 1200 DULUX PRO PREMIUM Velvet Matte Flat Interior Wall & Ceiling Paint (<80 g/L VOC).
    b. 9100 DULUX LIFEMASTER Flat Interior Enamel (0 g/L VOC).
    c. 1221 DULUX PRO STANDARD Flat Interior Wall & Ceiling Paint (50 g/L VOC).

3. Pittsburgh Paints:

    a. 6-70 Line SpeedHide Wall Flat Latex Paint (17.0 g/L VOC): Applied at a dry film thickness of not less than 1.1 mils (0.030 mm).
    b. 9-100 Series Pure Performance Interior Flat Latex Paint (0 g/L VOC): Applied at a dry film thickness of not less than 1.6 mils.

4. Sherwin Williams:

    a. ProGreen 200 Interior Latex Flat, B30-600 Series (<50 g/L VOC): Applied at a wet film thickness of 4 mils wet and a dry film thickness of not less than 1.8 mils.

B. Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell acrylic-latex interior enamel.

1. Benjamin Moore:

    a. Aura Waterborne Interior Eggshell Finish, 524: Applied at a dry film thickness of not less than 2.0 mils.

2. ICI:

    a. 1402 DULUX PRO PREMIUM Eggshell Interior Wall & Trim Enamel (<60 g/L VOC).
    b. 9300 DULUX LIFEMASTER Eggshell Interior Enamel (0 g/L VOC).
    c. 1423 DULUX PRO STANDARD Eggshell Interior Wall & Trim Enamel (<45 g/L VOC).

3. Pittsburgh Paints:

    a. 6-411 Series SpeedHide Eggshell Acrylic Latex Enamel (67 g/L VOC): Applied at a dry film thickness of not less than 1.5 mils.
    b. 9-300 Series Pure Performance Interior Eggshell Latex Paint (0 g/L VOC): Applied at a dry film thickness.

4. Sherwin Williams:

    a. S-W ProGreen 200 Interior Latex Eg-Shel B20-650 Series (41 g/L VOC): Applied at a wet film thickness of 4 mils, and a dry film thickness of not less than 1.7 mils per coat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION AND APPLICATION

A. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

C. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Mechanical Work:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Tanks that do not have factory-applied final finishes.
e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical Work:

a. Exposed conduit, boxes, and panelboards.

D. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.3 INTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Quick-Drying Enamel System:

a. Prime Coat: Quick-drying alkyd metal primer.
b. Intermediate Coat: Quick-drying enamel matching topcoat.
c. Topcoat: Quick-drying enamel semigloss.

B. Galvanized-Metal Substrates:

1. Latex System:

    a. Prime Coat: Cementitious galvanized-metal primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex eggshell.

C. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System:

    a. Prime Coat: Quick-drying primer for aluminum.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex eggshell.

D. Gypsum Board Substrates:

1. Latex System:

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex eggshell.

E. Dressed Lumber Substrates: Including architectural woodwork, doors, and trim.

1. Latex System:

    a. Prime Coat: Interior latex-based wood primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex semigloss.

F. Wood Panel Substrates: Including painted plywood, medium-density fiberboard, and hardboard.

1. Latex System:

    a. Prime Coat: Interior latex-based wood primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex semigloss.

END OF SECTION 09 91 23

SECTION 10 21 13 – TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes toilet compartments and screens as follows:

1. Type: Steel, color-coated finish.
2. Compartment Style: Ceiling hung.
3. Screen Style: Wall hung.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details of installation, and attachments to other Work.

C. Samples: For each exposed finish and for each color and pattern required.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Accurate Partitions Corporation.
2. Bobrick Washroom Equipment, Inc.
3. Capitol Partitions, Inc.
4. Commercial and Architectural Products, Inc.; Marlite.
5. Crane Plumbing; Sanymetal.
6. General Partitions Mfg. Corp.
7. Global Steel Products Corp.
8. Metpar Corp.
9. Santana Products, Inc.

2.2 MATERIALS

A. Panel, Pilaster, and Door Material:

1. Steel Sheets with Color-Coated Finish: Mill-phosphatized, corrosion-resistant steel sheet; stretcher-leveled flatness, ASTM A 591/A 591M, Class C, or ASTM A 653/A 653M; with manufacturer's standard baked finish.

a. Color: As selected from manufacturer's full range.

B. Core Material for Metal-Faced Units: Sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) minimum for doors, panels, and screens and 1-1/4 inches (32 mm) minimum for pilasters.

C. Pilaster Shoes and Sleeves (Caps): Stainless steel, not less than 3 inches (75 mm) high.

D. Stirrup Brackets: Clear-anodized aluminum.

E. Continuous Brackets: Clear-anodized aluminum.

2.3 FABRICATION

A. Toilet Compartments: Ceiling hung.

B. Urinal Screens: Wall hung.

C. Metal Units: Internally reinforce metal panels for hardware, accessories, and grab bars.

D. Doors: Unless otherwise indicated, 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be accessible to people with disabilities.

E. Door Hardware: Stainless steel. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.

1. Hinges: Self-closing type, adjustable to hold door open at any angle up to 90 degrees.
2. Latches and Keepers: Surface-mounted unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be handicapped accessible.
3. Coat Hook: Combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
4. Door Bumper: Rubber-tipped bumpers at out-swinging doors or entrance screen doors.
5. Door Pull: Provide at out-swinging doors. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units rigid, straight, level, and plumb, with not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Provide brackets, pilaster shoes, bracing, and other components required for a complete installation.

Use theft-resistant exposed fasteners finished to match hardware. Use sex-type bolts for through-bolt applications.

1. Brackets: Align brackets at pilasters with brackets at walls.
2. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

END OF SECTION 10 21 13

SECTION 10 51 13 - METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard metal lockers.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.

B. Shop Drawings: For metal lockers. Include plans, elevations, sections, details, and attachments to other work.

1. Show locker trim and accessories.
2. Include locker identification system and numbering sequence.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Qualification Data: For qualified Installer.

E. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

F. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain metal lockers and accessories from single source from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for All-Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

B. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

C. Anchors: Material, type, and size required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.

2.2 STANDARD METAL LOCKERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Penco Products, Inc., Vanguard or comparable product by one of the following:

1. Art Metal Products.
2. ASI Storage Solutions Inc.
3. Hadrian Manufacturing Inc.; Emperor Lockers.
4. Lyon Workspace Products, LLC.
5. Republic Storage Systems Company
6. Shanahan's Manufacturing Limited.

B. Locker Arrangement: Six tier.

C. Material: Cold-rolled steel sheet.

D. Body: Assembled by riveting or bolting body components together. Fabricate from unperforated steel sheet as follows:

1. Tops, Bottoms, and Intermediate Dividers: 0.024-inch (0.61-mm) nominal thickness, with single bend at sides.
2. Backs and Sides: 0.024-inch (0.61-mm) nominal thickness, with full-height, double-flanged connections.
3. Shelves: 0.024-inch (0.61-mm) nominal thickness, with double bend at front and single bend at sides and back.

E. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.

F. Doors: One piece; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

1. Doors less than 12 inches (305 mm) wide may be fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
2. Doors for box lockers less than 15 inches (381 mm) wide may be fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
3. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
4. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet; welded to inner face of doors.
5. Door Style: Vented panel as follows:

    a. Louvered Vents: No fewer than three louver openings at top or bottom, for six-tier lockers.

G. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches (51 mm) high. Provide no fewer than three hinges for each door more than 42 inches (1067 mm) high.

H. Projecting Door Handle and Latch: Finger-lift latch control designed for use with padlocks; positive automatic latching, chromium plated; pry and vandal resistant.

I. Combination Padlocks: Provided by Owner.

J. Equipment: Equip each metal locker with identification plate.

K. Accessories:

1. Legs: 6 inches (152 mm) high; formed by extending vertical frame members, or fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to bottom of locker.

a. Closed Front and End Bases: Fabricated from 0.036-inch (0.91-mm) nominal-thickness steel sheet.

2. Continuous Sloping Tops: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch (0.91-mm) nominal-thickness steel sheet.

a. Closures: Vertical-end type.

3. Finished End Panels: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.

L. Finish: powder coat.

1. Color(s): As selected by Architect from manufacturer's full range.

2.3 FABRICATION

A. Fabricate metal lockers square, rigid, and without warp and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

C. Knocked-Down Construction: Fabricate metal lockers using nuts, bolts, screws, or rivets for preassembly at plant prior to shipping.

D. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.

E. Continuous Base: Formed into channel or zee profile for stiffness, and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.

F. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.

1. Sloping-top corner fillers, mitered.

G. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.

1. Provide one-piece panels for double-row (back-to-back) locker ends.

2.4 STEEL SHEET FINISHES

A. Factory finish steel surfaces and accessories except stainless-steel and chrome-plated surfaces.

B. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.

B. Knocked-Down Metal Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.

C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
   1. Attach door locks on doors using security-type fasteners.
   2. Identification Plates: Identify metal lockers with identification indicated on Drawings.

      a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
   3. Attach sloping-top units to metal lockers, with closures at exposed ends.
   4. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

C. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 10 51 13

SECTION 12 48 16 – ENTRANCE FLOOR GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes recessed foot grilles and frames.

1.2 SUBMITTALS

A. Product Data: For each type of foot grille and frame indicated.

B. Shop Drawings: Show fabrication, assembly, joint locations, installation details, layout, plans, elevations, full-scale sections, details of patterns or designs, anchors, and accessories for foot grilles and frames.

C. Samples: 12-inch- (300-mm-) square assembled sections of foot grille, frame members, and tread rails with selected tread surface of each type of metal finish and color of exposed grille treads, tread rails, frames, and accessories required.

D. Maintenance data.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

B. Stainless-Steel Angles: ASTM A 276 or ASTM A 479/A 479M, corrosion resistant, Type 304.

2.2 FOOT GRILLES

A. Basis of Design: Construction Specialties 1 1/8" Gridline with level base frame and hidden lock downs, or provide equivalent products by one of the following:

1. Arden Architectural Specialties, Inc.
2. Balco, Inc.
3. J. L. Industries.
4. Reese Enterprises, Inc.

B. Stainless-Steel Foot Grilles: Type 304.

1. Support Rods: Spaced 1 inch (25 mm) o.c., welded to each wire.
2. Pit Grating: 1-1/8 inches (28.5 mm) deep.
3. Lockdown: Hidden.

4. Frame: Stainless-steel angle.
5. Finish: No. 4.

C. Manufacturer's standard frames of size and style for grille type, for permanent recessed installation in subfloor, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.

D. Level Bed Support System: Manufacturer's standard vinyl cushion support system.

2.3 FABRICATION

A. Shop fabricate foot grilles to the greatest extent possible. If not otherwise indicated, provide each grille as a single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from normal traffic lanes.

B. Fabricate frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grille to be installed in exterior composite decking. Coordinate framing requirements with deck installer. Examine floor conditions for compliance with location and size requirements. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Install components with top of foot grilles and frames in relationship to one another and to adjoining finished flooring as recommended in writing by manufacturer.

C. After completing frame installations, provide temporary filler of plywood or fiberboard in foot grille recesses and cover frames with plywood protective flooring. Maintain protection until Substantial Completion.

END OF SECTION 12 48 16

SECTION 31 31 16 - TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil treatment with termiticide.

1.2 SUBMITTALS

A. Product Data: For each type of termite control product.

1. Include the EPA-Registered Label for termiticide products.

B. Qualification Data: For qualified Installer.

C. Product Certificates: For termite control products, from manufacturer.

D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's records and include the following:

1. Date and time of application.
2. Moisture content of soil before application.
3. Termiticide brand name and manufacturer.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes used, and rates of application.
6. Areas of application.
7. Water source for application.

E. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who is accredited by manufacturer.

B. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.

C. Source Limitations: Obtain termite control products from single source from single manufacturer.

D. Preinstallation Conference: Conduct conference at Project site.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.

B. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.

1.5 WARRANTY

A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

1.6 MAINTENANCE SERVICE

A. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, terms for agreement period, and terms for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

A. Termiticide: Provide an EPA-Registered termiticide, complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Corporation, Agricultural Products; Termidor.
b. Bayer Environmental Science; Premise 75.
c. FMC Corporation, Agricultural Products Group; Torpedo, Talstar or Prevail FT.
d. Syngenta; Demon TC.

2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label requirements, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.

B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control treatment. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.

1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 APPLYING SOIL TREATMENT

A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.

1. Slabs-on-Grade: Underground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil, including soil along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases;

and along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.

3. Crawlspaces: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
4. Masonry: Treat voids.
5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.

D. Post warning signs in areas of application.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 31 31 16

SECTION 32 14 00 - UNIT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Concrete pavers set in aggregate and mortar setting beds.

1.3 SUBMITTALS

A. Product Data: For materials other than water and aggregates.

B. Product Data: For the following:

   1. Pavers.
   2. Mortar and grout materials.
   3. Edge restraints.

C. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C 136.

D. Samples for Initial Selection: For the following:

   1. Each type of unit paver indicated.

E. Samples for Verification:

   1. Full-size units of each type of unit paver indicated.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

   1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

1.6 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and higher.

a. When ambient temperature exceeds 100 deg F (38 deg C), or when wind velocity exceeds 8 mph (13 km/h) and ambient temperature exceeds 90 deg F (32 deg C), set pavers within 1 minute of spreading setting-bed mortar.

PART 2 - PRODUCTS

2.1 CONCRETE PAVERS

A. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936, made from normal-weight aggregates.

1. Manufacturer:

a. Pavestone Company (281-391-7283).

2. Thickness: 2-3/8 inches (60 mm).
3. Face Size and Shape: 3-7/8-by-7-7/8-inch (98-by-200-mm) rectangle.
4. Color: As selected by Architect from manufacturer's full range.

2.2 CURBS AND EDGE RESTRAINTS

A. Steel Edge Restraints: Manufacturer's standard painted steel edging 3/16 inch (4.8 mm) thick by 4 inches (100 mm) high with loops pressed from or welded to face to receive stakes at 36 inches (900 mm) o.c., and steel stakes 15 inches (380 mm) long for each loop.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Border Concepts, Inc.
b. Collier Metal Specialties, Inc.
c. J. D. Russell Company (The).
d. Sure-loc Edging Corporation.

2. Color: As selected by Architect from manufacturer's full range.

B. Job-Built Concrete Edge Restraints: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of 3000 psi (20 MPa).

2.3 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Subbase: Sound, crushed stone or gravel complying with ASTM D 448 for Size No. 57.

B. Graded Aggregate for Base: Sound, crushed stone or gravel complying with ASTM D 448 for Size No. 8.

C. Sand for Leveling Course: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33 for fine aggregate.

D. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 (1.18-mm) sieve and no more than 10 percent passing No. 200 (0.075-mm) sieve.

2.4 MORTAR SETTING-BED MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II.

B. Hydrated Lime: ASTM C 207, Type S.

C. Sand: ASTM C 144.

D. Latex Additive: Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed, and not containing a retarder.

E. Water: Potable.

2.5 MORTAR MIXES

A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed of uniform quality and with optimum performance characteristics. Discard mortars if they have reached their initial set before being used.

B. Mortar-Bed Bond Coat: Mix neat cement and latex additive to a creamy consistency.

C. Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C 270, Proportion Specification.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

B. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

C. Proof-roll prepared subgrade to identify soft pockets and areas of excess yielding. Proceed with unit paver installation only after deficient subgrades have been corrected and are ready to receive subbase and base course for unit pavers.

3.3 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

1. For concrete pavers, a block splitter may be used.

D. Joint Pattern: As indicated.

E. Tolerances: Do not exceed 1/16-inch (1.6-mm) unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches (3 mm in 600 mm) and 1/4 inch in 10 feet (6 mm in 3 m) from level, or indicated slope, for finished surface of paving.

F. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

1. Install edge restraints to comply with manufacturer's written instructions. Install stakes at intervals required to hold edge restraints in place during and after unit paver installation.
2. For metal edge restraints with top edge exposed, drive stakes at least 1 inch (25 mm) below top edge.
3. Install job-built concrete edge restraints to comply with requirements in Division 03 Section "Cast-in-Place Concrete."

3.4 AGGREGATE SETTING-BED APPLICATIONS

A. Compact soil subgrade uniformly to at least 95 percent of ASTM D 698 laboratory density.

B. Proof-roll prepared subgrade to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

C. Place aggregate subbase and base, compact by tamping with plate vibrator, and screed to depth indicated.

D. Place leveling course and screed to a thickness of 1 to 1-1/2 inches (25 to 38 mm), taking care that moisture content remains constant and density is loose and uniform until pavers are set and compacted.

E. Treat leveling course with herbicide to inhibit growth of grass and weeds.

F. Set pavers with a minimum joint width of 1/16 inch (1.5 mm) and a maximum of 1/8 inch (3 mm), being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

G. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

H. Do not allow traffic on installed pavers until sand has been vibrated into joints.

I. Repeat joint-filling process 30 days later.

3.5 MORTAR SETTING-BED APPLICATIONS

A. Saturate concrete subbase with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.

B. Apply mortar-bed bond coat over surface of concrete subbase about 15 minutes before placing mortar bed. Limit area of bond coat to avoid its drying out before placing setting bed. Do not exceed 1/16-inch (1.6-mm) thickness for bond coat.

C. Apply mortar bed over bond coat; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.

D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.

E. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/16-inch- (1.5-mm-) thick bond coat to mortar bed or to back of each paver with a flat trowel.

F. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.

G. Spread dry sand and fill joints after pavers are set and mortar bed has cured. Add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling

3.6 REPAIRING

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

END OF SECTION 32 14 00