PROJECT MANUAL

LAS SENDAS OFFICE CONDOMINIUMS
Shell Building

Mesa, Arizona

Parcel No. 219-17-494

Case N0. Z06-55 Ordinance 4595

For:
First Arizona Partners 1 LLC
5041 Pershing Avenue
Scottsdale, AZ, 85254

group **RENAISSANCE**
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February 15, 2007

SET NO.____

gR Project No.
0524

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists a 10,400 SF two story office building located at 7565 E. Eagle Crest Driveon Litchfield Road, South of Bell Road, in Surprise, AZ located on a .94 acre parcel. The building will be developed for 200 dining seats, bar, approximate 2,064 SF kitchen, circulation space, and the required toilets and janitor spaces.

The building site is Parcel 219-17-494 and will be developed in accordance with Planning and Zoning Commission's Desert Uplands Guidelines. The site is located in the Las Sendas Custom Home Community, immediately North of the Las Sendas Golf Course.

Site Area:	65,906 SF (1.51 Acres)
Address:	7565 E. Eagle Crest Drive, Mesa, Arizona 85207
Flood Zone:	X500
Zoning:	C-2 Intermediate Commercial, under Desert Uplands Guidelines
Proposed Building Occupancy:	B (Office)
Construction Type:	Type V-B Combustible
Building Use:	Shell Building for (4) Office Suites

Parking criteria for general offices developed in Mesa: "General offices/retail and services" at the rate of 1 space/375 S.F. G.F.A

Lower Level Parking spaces required:	15 parking spaces
Upper Level Parking spaces	13 parking spaces
4 spaces will be accessible	
Total parking:	28 parking spaces and 2 loading zones.

Access to the site will be from the private drive developed by the golf course (permanent easement recorded in 1999).

B. Contract Documents, dated May 10, 2004 were prepared for the Project by:

***group* RENAISSANCE**
2018 W. Cambridge Ave. Phoenix, AZ 85009
P: 602.258.8008 F: 208.977.8081

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

1.3 WORK UNDER OTHER CONTRACTS

1.4 FUTURE WORK

A. Future Contract: The Owner(s) may award separate contracts for additional work to be performed at the site following Substantial Completion. Completion of that work depends on successful completion of preparatory work under this Contract. The Contract for future work includes the following:

1. Contracts: A separate contracts may be awarded for tenant development of the interiors.

1.5 WORK SEQUENCE

A. The Work will be conducted in a single phase.

1.6 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the construction site (parcel). The Contractor's use of the premises is limited only by the Owner's right to retain other contractors on portions of the Project and any separate work occurring on adjacent parcels.

2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Golf Course patrons and employees, the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.7 OCCUPANCY REQUIREMENTS

A. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.
2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
4. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

1.8 PRODUCTS ORDERED IN ADVANCE

1.9 OWNER-FURNISHED PRODUCTS

The Owner will furnish the following products. None Anticipated

1.10 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

3.1 SCHEDULE OF PRODUCTS ORDERED IN ADVANCE

END OF SECTION 01010

SECTION 01020 - ALLOWANCES

1.1 General

A. Selected materials and equipment, and in some cases, installation are included in Contract Documents by allowances. Allowances are established to defer selection until more information is available. Other requirements will be issued by a Change Order.

B. Types of allowances required include the following:

1. Lump sum allowances.
2. Inspection and testing allowances.

C. Procedures for submitting and handling Change Orders are included in Section "Change Order Procedures."

F. Contingency Allowances: Use the contingency allowance only as directed for the Owner's purposes, and only by Change Orders which designate amounts to be charged to the allowance.

G. Cost and scheduling of testing of soil compaction, concrete, and Special Structural Inspections are the responsibility of the Contractor. The following inspection and testing allowances are for include cost of engaging the inspection or testing agencies and costs for reporting results as well as costs for actual inspections and tests.

1. The allowance includes incidental labor required to assist the agency, or costs for retesting on failure of previous tests and inspections. **The allowance includes costs of services not required by other sections of the Contract Documents.**
2. At Project closeout, credit unused amounts remaining in the inspection and testing allowance to Owner by Change Order.

SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Include the sum of $7,000 for Special Soils Engineer Reviews and Evaluations **(Owner authorized and directed). All Soil compaction and other testing shall be the contractor's responsibility**.
B. Allowance No. 2: Include the sum of $1,500 for Steel Door hardware purchase and installation.
C. Allowance No. 3: Include the sum of $1,500 for Deferred Wood Truss Structural Review.

D. Allowance No. 4: Include the sum of $3,500 for Modification of the existing monument sign at the main entry.

END OF SECTION 01020

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

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

1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

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

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

a. Contractor's Construction Schedule.
b. Application for Payment forms, including Continuation Sheets.
c. List of subcontractors.
d. Schedule of allowances.
e. Schedule of alternates.
f. List of products.
g. List of principal suppliers and fabricators.
h. Schedule of submittals.

2. Submit the Schedule of Values to the Architect at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.

C. Format and Content: Use the Project Manual table of contents as a guide to establish the format 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 the Architect.
c. 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 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 Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
4. Round amounts to nearest whole dollar; the 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 requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin 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 the Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives 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 by the Architect and paid for by the Owner.

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

B. Payment-Application Times: The date for each progress payment is the 25th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 7 days prior to the date for each progress payment.

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

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

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect.

F. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.

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

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

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

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

1. List of subcontractors.
2. List of principal suppliers and fabricators.
3. Schedule of Values.
4. Contractor's Construction Schedule (preliminary if not final).
5. Submittal Schedule (preliminary if not final).
6. List of Contractor's staff assignments
7. Copies of building permits
8. Copies of authorizations and licenses from governing authorities for performance of the Work.
9. Certificates of insurance and insurance policies.

K. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

2. Administrative actions and submittals that shall precede or coincide with this application include:
   a. Occupancy permits and similar approvals.
   b. Warranties (guarantees) and maintenance agreements.
   c. Test/adjust/balance records.
   d. Maintenance instructions.
   e. Meter readings.
   f. Changeover information related to Owner's occupancy, use, operation, and maintenance.
   g. Final cleaning.
   h. Application for reduction of retainage and consent of surety.
   i. Advice on shifting insurance coverages.
   j. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

L. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Proof that taxes, fees, and similar obligations were paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.
9. Change of door locks to Owner's access.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

SECTION 01035 - MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

1. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
2. Division 1 Section "Applications for Payment" for administrative procedures governing Applications for Payment.
3. Division 1 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. The Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on AIA Form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER PROPOSAL REQUESTS

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

1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
2. Within 10 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.

    a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

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

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

C. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

D. Proposal Request Form: Use forms provided by the Owner for Change Order Proposals. Sample copies are included at the end of this Section.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

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

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

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

1.7 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Architect will issue a Change Order for signatures of the Owner and the Contractor on AIA Form G701.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01035

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Coordination Drawings.
4. Administrative and supervisory personnel.
5. Cleaning and protection.

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

1. Division 1 Section "Field Engineering" specifies procedures for field engineering services, including establishment of benchmarks and control points.
2. Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.
3. Division 1 Section "Materials and Equipment" for coordinating general installation.
4. Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.3 COORDINATION

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

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

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

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

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

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

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

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

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION 01040

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cutting and patching.

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

1. Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.
2. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.
2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.
4. Indicate dates when cutting and patching will be performed.
5. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
6. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction.

b. Bearing and retaining walls.
c. Structural concrete.
d. Structural steel.
e. Lintels.
f. Timber and primary wood framing.
g. Structural decking.
h. Stair systems.
i. Miscellaneous structural metals.
j. Exterior curtain-wall construction.
k. Equipment supports.
l. Piping, ductwork, vessels, and equipment.
m. Structural systems of special construction in Division 13 Sections.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Primary operational systems and equipment.
b. Air or smoke barriers.
c. Water, moisture, or vapor barriers.
d. Membranes and flashings.
e. Fire protection systems.
f. Noise and vibration control elements and systems.
g. Control systems.
h. Communication systems.
i. Conveying systems.
j. Electrical wiring systems.
k. Operating systems of special construction in Division 13 Sections.

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

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

a. Processed concrete finishes.
b. Stonework and stone masonry.
c. Ornamental metal.
d. Matched-veneer woodwork.
e. Preformed metal panels.
f. Firestopping.
g. Window wall system.
h. Stucco and ornamental plaster.
i. Acoustical ceilings.
j. Terrazzo.
k. Finished wood flooring.
l. Fluid-applied flooring.

m. Carpeting.
n. Aggregate wall coating.
o. Wall covering.
p. Swimming pool finishes.
q. HVAC enclosures, cabinets, or covers.

1.5 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

3.2 PREPARATION

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

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

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

D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

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

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.
5. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. 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. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color 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 smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.
4. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic contract definitions are included in the Conditions of the Contract.

B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.

D. "Approved": The term "approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding

generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

J. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 16-Division format and MasterFormat's numbering system.

B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Streamlined Language: The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

    a. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Except where 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 the standards in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with 2 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 to the Architect before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.

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

minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006	(202) 862-5104
AABC	Associated Air Balance Council 1518 K St., NW Washington, DC 20005	(202) 737-0202
AAMA	American Architectural Manufacturers Assoc. 1540 E. Dundee Road, Suite 310 Palatine, IL 60067	(708) 202-1350
AAN	American Association of Nurserymen 1250 Eye St., NW, Suite 500 Washington, DC 20005	(202) 789-2900
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI 48219	(313) 532-2600
ACIL	American Council of Independent Laboratories 1629 K St., NW Washington, DC 20006	(202) 887-5872
ACPA	American Concrete Pipe Assoc. 8300 Boone Blvd., Suite 400 Vienna, VA 22182	(703) 821-1990
AGA	American Gas Assoc.	

	1515 Wilson Blvd. Arlington, VA 22209	(703) 841-8400
AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052	(606) 288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006	(202) 626-7300
AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001	(312) 670-2400
AISI	American Iron and Steel Institute 1101 17th St., NW Washington, DC 20036-4700	(202) 452-7100
AITC	American Institute of Timber Construction 7012 S. Revere Parkway, #140 Englewood, CO 80112	(303) 792-9559
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875	(301) 972-1700
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036	(212) 642-4900
APA	American Plywood Assoc. P.O. Box 11700 Tacoma, WA 98411	(206) 565-6600
API	American Petroleum Institute 1220 L St., NW Washington, DC 20005	(202) 682-8000
ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203	(703) 524-8800
ASA	Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797	(516) 576-2360
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329	(404) 636-8400
ASME	American Society of Mechanical Engineers 345 East 47th St.	

	New York, NY 10017	(212) 705-7722
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362	(805) 495-7120
ASSE	American Society of Sanitary Engineering P.O. Box 40362 Bay Village, OH 44140	(216) 835-3040
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187	(215) 299-5400
AWI	Architectural Woodwork Institute P.O. Box 1550 13924 Braddock Rd., No. 100 Centerville, VA 22020	(703) 222-1100
AWS	American Welding Society 550 LeJeune Rd., NW Miami, FL 33126	(305) 443-9353
BHMA	Builders' Hardware Manufacturers Assoc. 355 Lexington Ave., 17th Floor New York, NY 10017	(212) 661-4261
BIA	Brick Institute of America 11490 Commerce Park Dr. Reston, VA 22091	(703) 620-0010
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, IL 60173	(708) 517-1200
CTI	Ceramic Tile Institute of America 12061 West Jefferson Blvd. Culver City, CA 90230	(310) 574-7800
DHI	Door and Hardware Institute 14170 Newbrook Dr. Chantilly, VA 22021-2223	(703) 222-2010
EIA	Electronic Industries Assoc. 2001 Pennsylvania Ave., NW Washington, DC 20006-1813	(202) 457-4900
EIMA	EIFS Industry Manufacturers Assoc. 2759 State Road 580, Suite 112 Clearwater, FL 34621	(813) 726-6477
FM	Factory Mutual Systems 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062	(617) 762-4300

GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002	(202) 289-5440
IEEE	Institute of Electrical and Electronic Engineers 345 E. 47th St. New York, NY 10017	(212) 705-7900
IESNA	Illuminating Engineering Society of North America 345 E. 47th St. New York, NY 10017	(212) 705-7913
IGCC	Insulating Glass Certification Council c/o ETL Testing Laboratories, Inc. P.O. Box 2040 Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
ILI	Indiana Limestone Institute of America Stone City Bank Building, Suite 400 Bedford, IN 47421	(812) 275-4426
NAAMM	National Association of Architectural Metal Manufacturers 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222
NAPA	National Asphalt Pavement Assoc. NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	(301) 731-4748
NBHA	National Builders Hardware Assoc. (Now DHI)	
NCMA	National Concrete Masonry Assoc. 2302 Horse Pen Rd. Herndon, VA 22071-3406	(703) 713-1900
NCPI	National Clay Pipe Institute P.O. Box 759 253-80 Center St. Lake Geneva, WI 53147	(414) 248-9094
NEC	National Electrical Code (from NFPA)	
NECA	National Electrical Contractors Assoc. 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814	(301) 657-3110
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(617) 770-3000 (800) 344-3555

NPCA	National Paint and Coatings Assoc. 1500 Rhode Island Ave., NW Washington, DC 20005	(202) 462-6272
NRCA	National Roofing Contractors Assoc. 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607	(708) 299-9070
NSF	National Sanitation Foundation 3475 Plymouth Rd. P.O. Box 130140 Ann Arbor, MI 48113-0140	(313) 769-8010
NWMA	National Woodwork Manufacturers Assoc. (Now NWWDA)	
NWWDA	National Wood Window and Door Assoc. 1400 E. Touhy Ave., #G54 Des Plaines, IL 60018	(708) 299-5200 (800) 223-2301
PCA	Portland Cement Assoc. 5420 Old Orchard Rd. Skokie, IL 60077	(708) 966-6200
SDI	Steel Door Institute 30200 Detroit Rd. Cleveland, OH 44145	(216) 889-0010
SGCC	Safety Glazing Certification Council c/o ETL Testing Laboratories Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
SIGMA	Sealed Insulating Glass Manufacturers Assoc. 401 N. Michigan Ave. Chicago, IL 60611	(312) 644-6610
SJI	Steel Joist Institute 1205 48th Avenue North, Suite A Myrtle Beach, SC 29577	(803) 449-0487
SMACNA	Sheet Metal and Air Conditioning Contractors National Assoc. 4201 Lafayette Center Dr. Chantilly, VA 22021	(703) 803-2980
SPRI	Single Ply Roofing Institute 20 Walnut St. Wellesley Hills, MA 02181	(617) 237-7879
SSPC	Steel Structures Painting Council 4516 Henry St. Pittsburgh, PA 15213	(412) 687-1113
TCA	Tile Council of America P.O. Box 326	

	Princeton, NJ 08542-0326	(609) 921-7050
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(708) 272-8800
WRI	Wire Reinforcement Institute 1101 Connecticut Ave. NW, Suite 700 Washington, DC 20036-4303	(202) 429-5125
WWPA	Western Wood Products Assoc. Yeon Building 522 SW 5th Ave. Portland, OR 97204-2122	(503) 224-3930
WWPA	Woven Wire Products Assoc. 2515 N. Nordica Ave. Chicago, IL 60635	(312) 637-1359

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01095

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Contractor's construction schedule.
2. Submittal schedule.
3. Shop Drawings.
4. Product Data.
5. Samples.
6. Quality assurance submittals.

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

1. Permits.
2. Applications for Payment.
3. Insurance certificates.
4. List of subcontractors.

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

1. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
2. Division 1 Section "Coordination" specifies requirements governing preparation and submittal of required Coordination Drawings.
3. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.
4. Division 1 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 DEFINITIONS

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

1. Preparation of Coordination Drawings is specified in Division 1 Section "Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

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

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

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

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

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

3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

    a. Allow 2 weeks for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
    b. If an intermediate submittal is necessary, process the same as the initial submittal.
    c. Allow 2 weeks for reprocessing each submittal.
    d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

    a. Project name.
    b. Date.
    c. Name and address of the Architect.
    d. Name and address of the Contractor.
    e. Name and address of the subcontractor.
    f. Name and address of the supplier.
    g. Name of the manufacturer.
    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 30 days after the date established for "Commencement of the Work."

1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.

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

1.6 SHOP DRAWINGS

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.
6. 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 36 by 48 inches (890 by 1220 mm).

7. Initial Submittal: Submit one correctable, translucent, reproducible print and one blue- or black-line print for the Architect's review. The Architect will return the reproducible print.
8. Initial Submittal: Submit 2 blue- or black-line prints for the Architect's review. The Architect will return one print.
9. Final Submittal: Submit 3 blue- or black-line prints; submit 5 prints where required for maintenance manuals. The Architect will retain 2 prints and return the remainder.
10. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Architect for distribution. The Architect will retain 2 prints and return the remainder.

    a. One of the prints returned shall be marked up and maintained as a "Record Document."

11. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.9 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:

    a. Manufacturer's printed recommendations.
    b. Compliance with trade association standards.
    c. Compliance with recognized testing agency standards.
    d. Application of testing agency labels and seals.
    e. Notation of dimensions verified by field measurement.
    f. Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
4. Submittals: Submit 2 copies of each required submittal; submit 4 copies where required for maintenance manuals. The Architect will retain one and will return the other marked with action taken and corrections or modifications required.

    a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

    a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
    b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.10 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

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

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

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

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.
b. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.

a. The Architect will review and return preliminary submittals with the Architect's notation, indicating selection and other action.

4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. The Architect will return one set marked with the action taken.
5. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.

a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.

a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.11 QUALITY ASSURANCE SUBMITTALS

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

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

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

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

1.12 ARCHITECT'S ACTION

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

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

B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When the Architect marks a submittal "Approved," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. Final-But-Restricted Release: When the Architect marks a submittal "Approved as Noted," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
3. Returned for Resubmittal: When the Architect marks a submittal "Not Approved, Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

a. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "Action Not Required."

C. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400 - QUALITY CONTROL SERVICES

1.1 General

A. This Section specifies requirements for quality control services. Quality control services include inspections and tests performed by independent agencies, governing authorities, as well as the Contractor.

B. Contractor Responsibilities: Provide inspections and tests specified or required by governing authorities; services include those specified to be performed by an independent agency not by the Contractor. Costs are included in the Contract.

1. Employ and pay an independent agency, to perform quality control services.
2. Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.

    a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

3. Associated Services: The Contractor shall cooperate with agencies performing inspections or tests and provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include but are not limited to:

    a. Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
    b. Take representative samples of materials that require testing or assist the agency in taking samples.
    c. Provide facilities for storage and curing of samples, and deliver samples to testing laboratories.
    d. Provide a preliminary design mix proposed for use for material mixes that require control by the testing agency.
    e. Provide security and protection of samples and test equipment at the Project site.

C. Duties of the Testing Agency: The agency engaged to perform inspections, and testing of materials and construction shall cooperate with the Architect and Contractor in performance of its duties, and provide qualified personnel to perform inspections and tests.

1. The agency shall notify the Architect and Contractor promptly of deficiencies observed during performance of its services.
2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

D. Coordination: The Contractor and each agency engaged to perform inspections and tests shall coordinate the sequence of activities to accommodate services with a minimum of delay. The Contractor and each agency shall coordinate activities to avoid removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling inspections, tests, taking samples and similar activities.

E. Submittals: The testing agency shall submit a certified written report of each inspection and test to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible, submit a certified written report of each inspection and test through the Contractor, in duplicate.

1. Submit additional copies of each report to the governing authority, when the authority so directs.
2. Report Data: Written reports of each inspection or test shall include, but not be limited to:

    a. Date of issue.
    b. Project title and number.
    c. Name, address and telephone number of testing agency.
    d. Dates and locations of samples and tests or inspections.
    e. Names of individuals making the inspection or test.
    f. Designation of the Work and test method.
    g. Identification of product and Specification Section.
    h. Complete inspection or test data.
    i. Test results and an interpretations of test results.
    j. Ambient conditions at the time of sample-taking and testing.
    k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
    l. Name and signature of laboratory inspector.
    m. Recommendations on retesting.

F. Qualification for Service Agencies: Engage inspection and testing agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and specialize in the types of inspections and tests to be performed.

1. Each inspection and testing agency engaged shall be authorized to operate in the State in which the Project is located.

G. Repair and Protection: Upon completion of inspection and testing repair damaged construction and restore substrates and finishes to eliminate deficiencies. Comply with requirements for "Cutting and Patching."

H. Protect construction exposed by or for quality control service activities, and protect repaired construction.

I. The Contractor is responsible for repair and protection regardless of the assignment of responsibility for inspection and testing.

END OF SECTION 01400

SECTION 01631 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

1. Division 1 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
2. Division 1 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.
3. Division 1 Section "Materials and Equipment" specifies requirements governing the Contractor's selection of products and product options.

1.3 DEFINITIONS

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

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
2. Revisions to the Contract Documents requested by the Owner or Architect.
3. Specified options of products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

A. Substitution Request Submittal: The Architect will consider requests for substitution if received within 15 days after commencement of the Work. Requests received more than 15 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

    a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
    b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
    c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
    d. Samples, where applicable or requested.
    e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
    h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within 1 week of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

    a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record noncompliance with these requirements.

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The request is timely, fully documented, and properly submitted.
4. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

B. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01631

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Inspection procedures.
2. Project record document submittal.
3. Operation and maintenance manual submittal.
4. Submittal of warranties.
5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.

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

2. Advise the Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
9. Complete final cleanup requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

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

1. The Architect will repeat inspection when requested and assured that the Work is substantially complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
3. Note related change-order numbers where applicable.
4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

G. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch (51-mm), 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn-around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Fixture lamping schedule.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

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

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.

8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

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

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

3.2 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls."

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

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

   a. Remove labels that are not permanent labels.
   b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
   c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
   d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
   e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

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

D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's

property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

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

END OF SECTION 01700

SECTION 01740 - WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

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

1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
2. Division 1 Section "Contract Closeout" specifies contract closeout procedures.
3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
2. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

END OF SECTION 01740

SECTION 02110 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. All work shall be in accordance with Native Plant Inventory and Preservation Plan

1.2 SUMMARY

A. This Section includes the following:
   1. Removal of vegetation in accordance with the Native Plant Inventory and Preservation Plan.
   2. Topsoil stripping.
   3. Clearing and grubbing.

1.3 PROJECT CONDITIONS

A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.

   1. Protect improvements on adjoining properties and on Owner's property.
   2. Restore damaged improvements to their original condition, as acceptable to property owners.

C. Improvements on Adjoining Property: Authority for performing removal and alteration work on property adjoining Owner's property will be obtained by Owner prior to award of contract.

   1. Extent of work on adjacent property is indicated on Drawings.

1.4 EXISTING SERVICES

A. General: Indicated locations are approximate; determine exact locations before commencing Work.

B. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work.

C. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SITE CLEARING

A. General: Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.

1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

B. Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches (100 mm). Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches (50 mm) in diameter, and without weeds, roots, and other objectionable material.

1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.

2. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.

C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.

1. Completely remove stumps, roots, and other debris protruding through ground surface.
2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

a. Place fill material in horizontal layers not exceeding 6 inches (150 mm) loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.

3.2 DISPOSAL OF WASTE MATERIALS

A. Burning on Owner's Property: Burning is not permitted on Owner's property.

B. Removal from Owner's Property: Remove waste materials and unsuitable or excess topsoil from Owner's property.

END OF SECTION 02110

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Soils Report, dated January 18, 2006.
C. Refer to Civil and landscaping Drawings for additional requirements.

1.2 SUMMARY

A. This Section includes the following:

1 Preparing and grading subgrades for slabs-on-grade, walks, pavements, and landscaping.
2 Excavating and backfilling for buildings and structures.
3 Rock excavation, removal and placement around the site as ornamental improvements (berms and rock landscaping).
4 Drainage and moisture-control fill course for slabs-on-grade.
5 Subbase course for walks and pavements.
6 Subsurface drainage backfill for walls and trenches.
7 Excavating and backfilling trenches within building lines.
8 Excavating and backfilling for underground mechanical and electrical utilities and appurtenances.

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

1. Division 2 Section "Site Clearing" for site stripping, grubbing, topsoil removal, and tree protection.
2. Division 2 Section "Landscape Work" for finish grading, including placing and preparing topsoil for lawns and planting.
3. Division 3 Section "Cast-In-Place Concrete" for concrete encasings, cradles, and appurtenances for utility systems.

1.4 DEFINITIONS

A. ENGINEER as mentioned in this specification shall refer to the Soils Engineer; Speedie & Associates, 602-997-6391 office, 602-943-5508 fax, 3331 East Wood Street,Phoenix, AZ 85040

B. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

C. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

D. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.

E. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.

F. Base Course: The layer placed between the subbase and surface pavement in a paving system.

G. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.

H. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

J. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.5 SUBMITTALS

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

D. Test Reports: In addition to test reports required under field quality control, submit the following:

1.6 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.

1.7 PROJECT CONDITIONS

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches (50 mm) in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

D. Backfill and Fill Materials: Satisfactory soil materials.

E. Subbase and Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 698, with at least 100 percent passing a 3 inch (76 mm) sieve and not more than 60 percent passing a No. 200 (75 micrometer) sieve.

F. Engineered Fill: Subbase or base materials.

G. Bedding Material: Subbase or base materials with 100 percent passing a 1 inch (25 mm) sieve and not more than 8 percent passing a No. 200 (75 micrometer) sieve.

H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch (38 mm) sieve and not more than 5 percent passing a No. 8 (2.36 mm) sieve.

I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2 inch (38 mm) sieve and 0 to 5 percent passing a No. 50 (300 micrometer) sieve.

J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 DEWATERING

A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.3 EXCAVATION

A. Explosives: Do not use explosives.

B. Excavating plans shall be reviewed by the ENGINEER during the bidding process and shall be approved by the ENGINEER prior to commencement of work. A qualified independent inspector shall perform the inspections for the documenting suitable foundation material.

C. Remove Unclassified and rock down to a satisfactory bed or sidewall approved after inspection by the testing laboratory. Use only drilling, picking, barring, wedging or similar methods that will leave the rock foundation surface against which concrete will be placed in an entirely solid and unshattered condition. Roughen smooth, flat rock surface, and cut smooth sloped rock surfaces into rough steps or benches to provide a bonding surface for the concrete.

D. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

E. Rock excavation:

A. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and un-stratified masses which cannot be removed without systematic drilling and blasting; (3) any minor concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and blasting.

B. It is expected that nearly all excavation can be accomplished using conventional equipment.

1. For general excavation, a D-9N Caterpillar tractor with a single shank ripper, 385BLHydraulic excavator, pneumatic rock hammering, or equivalent equipment, is considered conventional equipment, if it can rip at a production rate of at least 300 bank cubic yards per hour.

2. For trench excavation, a 235C Caterpillar excavator with a medium stick and a rock ripping bucket, pneumatic rock hammering, or equivalent equipment, is considered conventional equipment, if it can excavate at a production rate of at least 30 bank cubic yards per hour.

C. If material is encountered which the CONTRACTOR believes cannot be excavated by conventional equipment, the ENGINEER shall be immediately notified. The CONTRACTOR shall provide performance tests of the specified conventional or equivalent equipment. If the ENGINEER confirms in writing that the specified conventional equipment cannot perform at the production rates specified, the excavation shall be considered rock excavation.

D. In areas to be later rip-rapped, large rock found during excavation may, upon approval of the ENGINEER, be left in place, excavated around and incorporated into the final riprap.

E. Should the CONTRACTOR encounter bedrock or excessive large boulders which will require extensive excavation to achieve final grade, the CONTRACTOR shall immediately notify the ENGINEER. The ENGINEER shall review the site condition requirements in the affected area in a timely manner and advise the CONTRACTOR on acceptable alternate excavation.

F. Payment for rock excavation shall be included in the base contract amount.

F. Rock (Boulder) Placement: Boulders measuring 1 cubic yard or more in volume may be selected for placement around the site as ornamental berms and rock gardens by the Landscape Architect and as indicated on the architectural site plan and Landscaping drawings. All other boulders will be used as fill, if approved by the ENGINEER, or removed from the site. Natural rock ledges and other outcroppings will be protected from damage.

3.4 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1.2 inches (30 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated slopes, lines, depths, and invert elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches (300 mm) each side of pipe or conduit unless otherwise indicated.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.

1. For pipes or conduit less than 6 inches (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Where encountering rock or another unyielding bearing surface, carry trench excavation 6 inches (150 mm) below invert elevation to receive bedding course.

3.8 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. When Architect determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect.

1. Fill unauthorized excavations under other construction as directed by the Architect.

B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Testing, inspecting, and approval of underground utilities.
4. Concrete formwork removal.
5. Removal of trash and debris from excavation.
6. Removal of temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.12 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches (450 mm) of footings. Place concrete to level of bottom of footings.

C. Provide 4 inch (100 mm) thick concrete base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installation and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.

D. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.

G. Place and compact final backfill of satisfactory soil material to final subgrade.

H. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 FILL

A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.

1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.

B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

C. Place fill material in layers to required elevations for each location listed below.

1. Under grass, use satisfactory excavated or borrow soil material.
2. Under walks and pavements, use subbase or base material, or satisfactory excavated or borrow soil material.
3. Under steps and ramps, use subbase material.
4. Under building slabs, use drainage fill material.
5. Under footings and foundations, use engineered fill.

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.

a. Stockpile or spread and dry removed wet satisfactory soil material.

3.16 COMPACTION

A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, compact the top 12 inches (300 mm) below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
2. Under walkways, compact the top 6 inches (150 mm) below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
3. Under lawn or unpaved areas, compact the top 6 inches (150 mm) below subgrade and each layer of backfill or fill material at 90 percent maximum dry density.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1.2 inches (30 mm).
2. Walks: Plus or minus 1.2 inches (30 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10 foot (3 m) straightedge.

3.18 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course material on prepared subgrades. Place base course material over subbases to pavements.

1. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 4254 relative density.
2. Shape subbase and base to required crown elevations and cross-slope grades.
3. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
4. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

3.19 FIELD QUALITY CONTROL

A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.

   a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
   b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.

2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Architect.
3. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet (30 m) or less of wall length, but no fewer than two tests along a wall face.
5. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet (45 m) or less of trench, but no fewer than two tests.

B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

B. Disposal: Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by Architect.

SECTION 02282 - TERMITE CONTROL

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 soil treatment for termite control.

1.3 SUBMITTALS

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

B. Product data and application instructions.

C. Certification that products used comply with U.S. Environmental Protection Agency (EPA) regulations for termiticides.

1.4 QUALITY ASSURANCE

A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for preparing substrate and application.

B. Engage a professional pest control operator who is licensed according to regulations of governing authorities to apply soil treatment solution.

C. Use only termiticides that bear a federal registration number of the EPA and are approved by local authorities having jurisdiction.

1.5 JOB CONDITIONS

A. Restrictions: Do not apply soil treatment solution until excavating, filling, and grading operations are completed, except as otherwise required in construction operations.

B. To ensure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

1.6 WARRANTY

A. Warranty: Furnish written warranty, executed by Applicator and Contractor, certifying that applied soil termiticide treatment will prevent infestation of subterranean termites. If

subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.

B. Warranty Period: 5 years from date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT SOLUTION

A. General: Use an emulsible, concentrated termiticide that dilutes with water, specially formulated to prevent termites infestation. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of following chemical elements.

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

PART 3 - EXECUTION

3.1 APPLICATION

A. Surface Preparation: Remove foreign matter 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 foundations. Toxicants may be applied before placing compacted fill under slabs if recommended by toxicant manufacturer.

B. Application Rates: Apply soil treatment solution as follows:

1. Under slab-on-grade structures, treat soil before concrete slabs are placed, using the following application rates:

    a. Apply 4 gallons of chemical solution per 10 linear feet (5.1 L of chemical solution per meter) to soil in critical areas under slab, including entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers.
    b. Apply 1 gallon of chemical solution per 10 sq. ft. (4.1 L of chemical solution per sq. m) as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1/2 gallon of chemical solution per 10 sq. ft. (6.1 L of chemical solution per sq. m) to areas where fill is washed gravel or other coarse absorbent material.
    c. Apply 4 gallons of chemical solution per 10 linear feet (5.1 L of chemical solution per meter) of trench for each 12 inches (300 mm) of depth from grade to footing, along outside edge of building. Dig a trench 6 to 8 inches (150 to 200 mm) wide along outside of foundation to a depth of not less than 12 inches (300 mm). Punch holes to top of footing at not more than 12 inches (300 mm) o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in the trench.

2. Treat soil under or around crawlspace structures as follows:

a. Apply 4 gallons of chemical solution per 10 linear feet (5.1 L of chemical solution per meter) of trench along inside of foundation walls, along both sides of interior partitions, and around piers and plumbing. Do not apply an overall treatment in crawlspaces.
b. Apply 4 gallons of chemical solution per 10 linear feet (5.1 L of chemical solution per meter) of trench, for each 12 inches (300 mm) of depth from grade to footing, along outside of foundation walls, including part beneath entrance platform porches, etc.
c. Apply 4 gallons of chemical solution per 10 linear feet (5.1 L of chemical solution per meter) along the inside and outside of foundation walls of porches.
d. Apply 1 gallon of chemical solution per 10 sq. ft. (4.1 L of chemical solution per sq. m) of soil surface as an overall treatment only where attached concrete platform and porches are on fill or ground.

3. At hollow masonry foundations or grade beams, treat voids at rate of 2 gallons per 10 linear feet 2.6 L per meter, poured directly into the hollow spaces.
4. At expansion joints, control joints, and areas where slabs will be penetrated, apply at rate of 4 gallons per 10 linear feet (5.1 L per linear m) of penetration.

C. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs after areas are covered by other construction.

D. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION 02282

SECTION 02711 - FOUNDATION DRAINAGE SYSTEM

1.1 GENERAL

A. Summary: Extent of foundation drainage system work is shown on drawings.

B. Certification: Submit Certification, signed by Contractor and foundation drainage system Installer, that installed materials conform to specified requirements and system was successfully checked and tested prior to covering with filtering and drainage fill.

1.2 PRODUCTS

A. Drainage Pipe and Fittings: Furnish drainage pipe complete with bends, reducers, adapters, couplings, collars, and joint materials.

B. Perforated Clay Pipe: ASTM C 700, "Standard Strength," unglazed.

C. Perforated Polyvinyl Chloride Pipe: ASTM D 2729.

D. Perforated Concrete Pipe: ASTM C 444, Type 1, and applicable requirements of ASTM C 14, Class 2.

E. Perforated Bituminized Fiber Pipe: ASTM D 2311.

F. Joint Screening: Furnish joint screening of the following for each open-joint portion of drain lines:
1. Synthetic drainage fabric.

G. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense composite.

H. Drainage Fill: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand with 100 percent passing a 1/2-inch sieve and 0-5 percent passing a No. 50 sieve.

I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand with 100 percent passing a 1-1/2-inch sieve and 0-5 percent passing a No. 50 sieve.

1.3 EXECUTION

A. Apply and compact impervious fill material to raise low areas or where unsatisfactory bearing soil may occur.

B. Impervious Fill at Footings: After concrete footings have been cured and forms removed, place impervious fill material on subgrade adjacent to bottom of footing. Place and compact impervious fill to dimensions indicated or, if not indicated, not less than 6 inches deep and 12 inches wide.

D. Filtering Material: Place supporting layer of filtering material over compacted subgrade where drainage pipe is to be laid to depth indicated or, if not indicated, to a compacted depth of not less than 4 inches.

E. Laying Drain Pipe: Lay drain pipe solidly bedded in filtering material. Provide full bearing for each pipe section throughout its length to true grades and alignment, and continuous slope in direction of flow.

1. Lay perforated pipe with perforations down and joints tightly closed in accordance with pipe manufacturers, recommendations. Provide collars and couplings as required.
2. Lay open-joint tile units spaced as indicated on drawings or, if not indicated, with 1/4-inch space between ends. Cover top 2/3 of joint opening with joint screening material and tie with corrosion resistant wire. Commercial joint cover assemblies may be provided if acceptable to Architect.
3. Provide recesses in excavation bottom to receive bells for drain pipe having bell and spigot ends. Lay pipe with bells facing up slope and with spigot end entered fully into adjacent bell. Seal joint in accordance with local practices having jurisdiction.

F. Testing Drain Lines: Test or check lines before backfilling to assure free flow. Remove obstructions, replace damaged components, and retest system until satisfactory.

G. After testing drain lines, place additional filtering material to a 4-inch depth around sides and top of drains.

H. Drainage Fill: Place drainage fill over drain lines after satisfactory testing and covering of drain lines with filtering material. Completely cover drain lines to a width of at least 6 inches on each side and above top of pipe to within 12 inches of finish grade. Place fill material in layers not exceeding 3 inches in loose depth and compact each layer placed.

1. Overlay drainage fill material with one layer of 15-lb., asphalt- or tar-saturated felt, overlapping edges at least 4 inches.

I. Fill to Grade: Apply impervious fill material over compacted drainage fill at footing drains, placing material in layers not exceeding 6 inches in loose depth and thoroughly compacting each layer. Carry impervious fill to indicated finish elevations and slope away from building perimeter.

END OF SECTION 02711

SECTION 03300 - CAST-IN-PLACE CONCRETE

1.1 GENERAL

A. This section applies to all cast-in-place-concrete not covered by the Structural, Civil, and Landscaping specifications

B. Submittals: Submit the following:

1. Product data for reinforcement, forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Architect.
2. Shop drawings for fabricating, bending, and placing concrete reinforcement.
3. Laboratory test reports or evaluation reports for concrete materials and concrete mix designs.

C. Quality Assurance: Comply with provisions of ACI 301, "Specifications for Structural Concrete for Buildings," ACI 318, "Building Code Requirements for Reinforced Concrete," and CRSI "Manual of Standard Practice," except where more stringent requirements are indicated.

1. Concrete Testing Service: Engage a testing agency acceptable to Architect to perform materials evaluation testing and to design concrete mixes.

a. Materials certificates signed by concrete producer and Contractor may be submitted in lieu of materials laboratory testing when acceptable to Architect.

1.2 PRODUCTS

A. Form Materials: Furnish form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.

1. Forms for Exposed Concrete Surfaces: Suitable panel-type material to provide continuous, straight, smooth, exposed surfaces.

B. Reinforcing Materials: As follows:

1. Deformed Reinforcing Bars: ASTM A 615, Grade 60, unless otherwise indicated.
2. Welded Wire Fabric: ASTM A 185.

C. Concrete Materials: As follows:

1. Portland Cement: ASTM C 150, Type 1.
2. Aggregates: ASTM C 33, except local aggregates of proven durability may be used when acceptable to Architect.
3. Water: Potable.

D. Admixtures: Provide admixtures that contain not more than 0.1 percent chloride ions.

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing, Retarding, and Accelerating Chemical Admixtures: ASTM C 494.

E. Related Materials: As follows:

1. Waterstops: Flat dumbbell or centerbulb type, size to suit joints, of either rubber (CRD C 513) or PVC (CRD C 572).
2. Vapor Retarder: Clear 8-mil-thick polyethylene.
3. Membrane-Forming Curing Compound: ASTM C 309, Type I. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 sq. ft./gal.

F. Mix Proportions and Design: Proportion mixes complying with mix design procedures specified in ACI 301.

2. Design mixes to provide normal weight concrete with the following properties:

   a. 3000-psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).

3. Limit maximum water-cement ratio of concrete exposed to freezing and thawing to 0.45. Limit maximum water-cement ratio of concrete exposed to deicing salts, brackish water, or seawater to 0.40.

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

   a. Ramps, Slabs, and Sloping Surfaces: Not more than 3 inches.
   b. Reinforced Foundation Systems: Not less than 1 inch and not more than 3 inches.
   c. Other Concrete: Not more than 4 inches.

5. Adjust mix designs when material characteristics, job conditions, weather, test results, or other circumstances warrant. Do not use revised concrete mixes until laboratory test data and strength results have been submitted to and reviewed by Architect.

G. Use air-entraining admixture in exterior exposed concrete, providing not less than 4.5 percent nor more than 7 percent entrained air for concrete exposed to freezing and thawing, and from 2 percent to 4 percent for other concrete.

H. Use water-reducing, accelerating, and retarding admixtures that have been tested and accepted in mix designs in strict compliance with manufacturer's directions.

I. Job-Site Mixing: Use drum-type batch machine mixer, mixing not less than 1-1/2 minutes for 1 cu. yd. or smaller capacity. Increase mixing time at least 15 seconds for each additional cu. yd.

J. Ready-Mix Concrete: ASTM C 94.

1.3 EXECUTION

A. Formwork: Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Select form materials to obtain required finishes.

1. Maintain formwork tolerances and surface irregularities within ACI 347 limits, Class A tolerances for concrete exposed to view and Class C tolerances for other concrete surfaces.
2. Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items built into forms.
3. Clean and adjust forms prior to concrete placement. Apply form-release agents or wet forms as required. Retighten forms during concrete placement, if required, to eliminate mortar leaks.

B. Vapor Retarders/Barriers: Place vapor retarder/barrier membrane for slabs on grade, with joints lapped 6 inches and sealed.

C. Reinforcement: Accurately position and support reinforcement, and secure against displacement. Locate and support reinforcement to maintain minimum cover with metal chairs, runners, bolsters, spacers, and hangers as required. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

1. Install welded wire fabric in lengths as long as practicable; lap at least one full mesh and lace splices with wire.

D. Joints: Locate and install construction, isolation, and control joints as indicated or required. Locate construction joints so they do not impair strength and appearance of structure. Place isolation and control joints in slabs-on-ground to stabilize differential settlement and prevent random cracking.

E. Installation of Embedded Items: Set and build anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting diagrams, templates, and instructions provided by others for locating and setting.

1. Locate and support waterstops to prevent displacement.

F. Concrete Placement: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," for placing concrete in a continuous operation within planned joints or sections. Do not begin concrete placement until other affected work is completed.

1. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping so that concrete is worked around reinforcement and other embedded items and into forms.
2. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.

a. In cold weather comply with ACI 306.
b. In hot weather comply with ACI 305.

G. Finish of Formed Surface: As follows:

1. Smooth-Formed Finish: Provide a smooth finish for concrete surfaces exposed to view and surfaces to be covered with a coating or covering material applied directly to concrete. Repair and patch defective areas, with fins and other projections completely removed and smoothed.

H. Monolithic Slab Finishes: As follows:

1. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish when surface water has disappeared and when concrete has stiffened sufficiently to permit operation of power-driven floats. Consolidate surface with power-driven floats or by hand-floating.

a. Check and level surface plane to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness). Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

2. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, paint, or other thin film-finish coating system.

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

3. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
4. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

    a. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route.

I. Curing: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, apply an evaporation-control compound according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

1. Begin initial curing as soon as free water has disappeared from exposed surfaces.
2. Continue curing unformed concrete surfaces by water ponding, continuous fog spraying, continuously wetted absorptive cover, or by moisture-retaining cover curing. Cure formed surfaces by moist curing until forms are removed. Keep concrete continuously moist for not less than 72 hours for high- early strength concrete and 7 days for all other concrete.
3. Apply membrane-forming curing compound to exposed interior slabs and to exterior slabs, walks, and curbs as soon as final finishing operations are complete. Apply uniformly according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

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

J. Field Quality Control: Perform sampling and testing during concrete placement, as follows:

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

    a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
    b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
    c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.

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

2. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.

END OF SECTION 03300

SECTION 04730

MANUFACTURED STONE VENEER

(Stone Veneer, Brick Veneer, and Trim)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Portland cement based manufactured [stone] [and] [brick] veneer and trim.

B. Related Sections:
1. 06000–Rough Carpentry Wall Framing.
2. 09000–Gypsum Wall Sheathing.
3. 07600–Flashing and Sheet Metal.
4. 07900–Joint Sealers.

1.02 REFERENCES

A. Building code applicable to project site.

B. American National Standards Institute (ANSI)
1. ANSI A118.4 Specifications for Latex-Portland Cement Mortar

C. American Society for Testing and Materials (ASTM):
1. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
2. ASTM C 67–Test Methods for Sampling and Testing Brick and Structural Clay Tile
3. ASTM C 144–Specification for Aggregate for Masonry Mortar
4. ASTM C 177–Test Method for Steady-State Head Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
5. ASTM C 190 – Method of Test for Tensile Strength of Hydraulic Cement Mortars
6. ASTM C 207–Specification for Hydrated Lime for Masonry Purposes
7. ASTM C 270–Specification for Mortar for Unit Masonry
8. ASTM C 348 – Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
9. ASTM C 482– Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement
10. ASTM C 567–Test Method for Unit Weight of Structural Lightweight Concrete
11. ASTM C 847–Specification for Metal Lath
12. ASTM C 979–Specification for Pigments for Integrally Colored Concrete
13. ASTM D 226–Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

D. Uniform Building Code Standards:
1. UBC Standard 14-1–Kraft Waterproof Building Paper
2. UBC Standard 15-5–Roof Tile

1.03 SUBMITTALS

A. Reference Section 01330–Submittal Procedures; submit following items:
   1. Product Data.
   2. Samples:
      a. Standard sample board consisting of small-scale pieces of veneer units showing full range of textures and colors.
      b. Full range of mortar colors.
   3. Verification Samples: Following initial sample selection submit "laid-up" sample board using the selected stone and mortar materials and showing the full range of colors expected in the finished Work; minimum sample size: 3 by 3 feet (1 by 1 m).
   4. Quality Assurance/Control Submittals:
      a. Qualifications:
         1) Proof of manufacturer qualifications.
         2) Proof of installer qualifications.
      b. Regulatory Requirements: Evaluation reports
      c. Veneer manufacturer's installation instructions.
      d. Installation instructions for other materials

B. Closeout Submittals: Reference Section 01780–Closeout Submittals; submit following items:
   1. Maintenance Instructions.
   2. Special Warranties.

1.04 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: Licensee of Eldorado Stone Corporation
   2. Installer Qualifications: Experienced mason familiar with installation procedures for manufactured veneer.

B. Certifications:
   1. ICBO Evaluation Service – Evaluation Report
   2. NES Evaluation Service- Evaluation Report
   3. LARR – Research Report
   4. HUD – Materials Release
   5. UL – Classification listing

C. Field Sample:
   1. Prepare 4 by 4 foot sample at a location on the structure as selected by the Architect. Use approved selection sample materials and colors. Include "Rustic Ledge, Clearwater".
   2. Obtain Architect's approval.
   3. Protect and retain sample as a basis for approval of completed manufactured stone work. Approved sample may be incorporated into completed work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Reference Section 01660–Product Storage and Handling Requirements.

B. Follow manufacturer's instructions.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements: When air temperature is 40 degrees F (4.5 degrees C) or below, consult local building code for Cold-Weather Construction requirements.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard warranty coverage against defects in materials when installed in accordance with manufacturer's installation instructions.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Eldorado Stone, LLC
1370 Grand Ave., Bldg. B
San Marcos, CA 92069

Tel: (800) 925-1491
Fax: (760) 736-8890
E-Mail: customerservice@eldoradostone.com
Website: www.eldoradostone.com

B. Product: Rustic Ledge, Clearwater veneer] [Other veneer types may be as shown on Drawings]

C. Substitutions: None allowed at this time.

2.02 MATERIALS

A. Veneer Units: Precast veneer units consisting of portland cement, sand, lightweight aggregates, and mineral oxide pigments.
1. Physical Properties:
a. Compressive Strength: ASTM C 39, 5 sample average..... 1,800psi (12.4 MPa)
b. Shear Test: ASTM C 482,..... 50 psi (345 kPa)
c. Water Absorption: UBC Standard 15-5,.....22 percent
d. Freeze-Thaw Test: ASTM C 67,.....Less than 3%
e. Thermal Resistance: ASTM C 177 .....R0.60 (0.11)
f. Density: ASTM C 567 (Dry density)..... 75 pcf (1200 kg per m^3)

B. Moisture Barrier: [ASTM D 226 No. 15 non-perforated asphalt-saturated organic felt] [UBC Standard 14-1 kraft waterproof building paper].

C. Reinforcing: [ASTM C 847 galvanized expanded metal lath] [ASTM C 847 painted expanded metal lath] [1 inch galvanized steel, 18 gauge woven wire mesh] complying with code agency requirements for the type of substrate over which stone veneer is installed.

D. Mortar:
1. Cement: Any cement complying with ASTM C 270.
2. Lime: ASTM C 207.
3. Sand: ASTM C 144, natural or manufactured sand.
4. Pigment: ASTM C 979, mineral oxide pigments.
5. Water: Potable.
6. Pre-Packaged Latex-Portland Cement Mortar: ANSI A118.4.

E. Bonding Agent: Daraweld®C as manufactured by Grace Construction, or equal Products

F. Sealer: Water based silane or siloxane masonry sealer, [clear] [semi-gloss]

2.03 ACCESSORIES

2.04 MORTAR MIXES

A. Jointless/Dry-Stacked Installation:
   1. Mix mortar in accordance with Eldorado Stone Corp. mortar preparation instructions.
      a. Add color pigment in accordance with pigment manufacturer's instructions.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates upon which work will be installed.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.02 PREPARATION

A. Protection: Protect adjacent work from contact with mortar.

B. Surface Preparation: Prepare substrate in accordance with manufacturer's installation instructions for the type of substrate being covered.

3.03 INSTALLATION

A. Install and clean stone in accordance with manufacturer's installation instructions for Jointless/Dry-Stacked installation.

B. Apply sealer in accordance with sealer manufacturer's installation instructions.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Manufacturer's Field Service Representative shall make periodic site visits for installation consultation and inspection as requested by Owner.

3.05 CLEANING

A. Reference Section 01740–Cleaning.

B. Remove protective coverings from adjacent work.

C. Cleaning Veneer Units:
   1. Wash with soft bristle brush and water/granulated detergent solution.
   2. Rinse immediately with clean water.

D. Removing Efflorescence:
   1. Allow veneer to dry thoroughly.
   2. Scrub with soft bristle brush and clean water.
   3. Rinse immediately with clean water; allow to dry
   4. If efflorescence is still visible, repeat above procedure using a solution of 1 part household vinegar and 5 parts water.
   5. Rinse immediately with clean water.

END OF SECTION[1]

SECTION 05500 - METAL FABRICATIONS

1.1 GENERAL

A. Refer to Structural drawings for additional requirements.

B. Submittals: In addition to product data, submit the following:

1. Shop drawings detailing fabrication and erection, including templates for anchor bolt placement.
2. Samples materials and finishes as may be requested by Architect.

1.2 PRODUCTS

A. General: Provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes.

B. Steel and Iron: As follows:

1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Rolled Floor Plates: ASTM A 786/A 786M.
3. Cold-Formed Tubing: ASTM A 500.
4. Hot-Formed Tubing: ASTM A 501.
5. Pipe: ASTM A 53, standard weight (schedule 40), unless otherwise indicated. Black finish, unless otherwise indicated.
6. Gray-Iron Castings: ASTM A 48, Class 30.
7. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.

C. Fasteners: Provide plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

D. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer with good resistance to corrosion, compatible with finish paint systems, and complying with performance requirements of FS TT-P-664.

E. Galvanizing Repair Paint: High-zinc-dust-content paint, with dry film containing not less than 94 percent zinc dust by weight.

F. Concrete Fill: Comply with requirements of Division 3 Section "Cast-in-Place Concrete" for normal-weight concrete with a minimum 28-day compressive strength of 3,000 psi (20 MPa).

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

H. Fabrication, General: Form from materials of type, size, thickness, and shapes indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support.

1. Shear and punch metals cleanly and accurately. Remove sharp or rough areas and ease exposed edges.

2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds and surfaces smooth and blended.
3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

I. Rough Hardware: Furnish custom-fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for supporting and anchoring woodwork.

1. Galvanize, unless otherwise indicated.

J. Loose Bearing and Leveling Plates: Provide for steel items bearing on masonry or concrete, as indicated. Drill plates to receive anchor bolts.

1. Galvanize after fabrication.

K. Loose Steel Lintels: Fabricate from shapes and to sizes indicated.

1. Galvanize after fabrication.

L. Miscellaneous Framing and Supports: Provide as required to complete the Work but not included with structural steel framework. Fabricate as indicated and required to receive adjacent construction. Fabricate from structural steel of welded construction. Drill and tap to receive hardware, hangers, and similar items. Include anchors for building into other work, spaced not more than 24 inches (600 mm) o.c.

M. Miscellaneous Steel Trim: Fabricate from steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.

N. Pipe Bollards: Fabricate from Schedule 80 steel pipe capped with 1/4-inch (6.4-mm) steel plate.

1. Fabricate sleeves for bollards from steel pipe with 1/4-inch- (6.4-mm-) thick steel plate welded to bottom of sleeve.

O. Finish metal fabrications after assembly. Comply with NAAMM "Metal Finishes Manual" for recommendations on application of finishes. Shop-prime ferrous metal items not indicated to be galvanized.

1. Hot-dip galvanize items indicated to be galvanized. Comply with ASTM A 153 or ASTM A 123 as applicable.
2. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with SSPC-SP 3 "Power Tool Cleaning."
3. Apply shop primer per requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting.

1.3 EXECUTION

A. Installation, General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set units accurately in location, with edges and surfaces level, plumb, and true.

1. Fit exposed connections accurately together and weld, unless otherwise indicated. Do not weld, cut, or abrade the surfaces of galvanized units that are intended for bolted connections.
2. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

B. Set loose items on cleaned bearing surfaces using wedges or other adjustable devices. After the items have been positioned and plumbed, tighten the anchor bolts and pack space with grout.

1. Use nonshrink, metallic grout in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.

C. Anchor bollards in concrete with pipe sleeves preset into concrete. Fill space between bollard and sleeve solidly with nonshrink, nonmetallic grout.

1. Fill bollards solidly with concrete, mounding top surface.

D. Touch up shop paint after erection. Clean field welds, bolted connections, and abraded areas and paint with same material as used for shop painting.

E. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint.

END OF SECTION 05500

SECTION 07120 - FLUID-APPLIED WATERPROOFING

1.1 General:

A. System Performance Requirements: Provide fluid-applied water-proofing membrane system that is watertight and complies with performance requirements specified, as demonstrated by testing performed by a nationally recognized independent testing laboratory of manufacturer's standard systems according to test methods indicated.

B. Submittals: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:

1. Product data for each type of fluid-applied waterproofing specified, including data substantiating that materials comply with specified requirements.
2. Samples, 3 inches by 6 inches minimum size, of each fluid-applied waterproofing material specified for Project.

C. Quality Assurance: Comply with the following:

1. Installer Qualifications: Engage an experienced Installer who has completed fluid-applied waterproofing applications similar in material, design, and extent to that indicated for Project and that has resulted in construction with a record of successful in-service performance.

D. Project Conditions: Proceed with waterproofing operations only after substrate construction and penetrating work have been completed and when existing and forecast weather conditions will permit work to be performed in accordance with manufacturer's recommendations.

1.2 Products:

A. Polyurethane-Based, 2-Component Waterproofing: Two-component, bitumen-modified, polyurethane-based liquid membrane waterproofing material, self-bonding to substrates, compounded specifically for application and slope of substrate indicated. Provide membrane with not less than 90 percent solids in uncured blend, tested by manufacturer to comply with requirements of ASTM C 836.

1. Products: Subject to compliance with requirements, provide one of the following:

a. "A-H Seamless Membrane 2-H"; Anti Hydro Company.
b. "Sure-Seal Liquiseal"; Carlisle SynTech Systems.
c. "Futura-Flex 520"; Futura Coatings, Inc.
d. "LM-60"; Gaco Western, Inc.
e. "Vulkem 222"; Mameco International, Inc.
f. "Perma-Guard III (No.7402 Series)"; The Neogard Corporation.
g. "Elasto-Deck 9000"; Pacific Polymers, Inc.
h. "Isoflex 550 SP"; Harry S. Peterson Co., Inc.

B. Polyurethane-Based, 1-Component Waterproofing: Single-component, bitumen-modified, polyurethane-based liquid membrane material, self-bonding to substrates, and compounded specifically for application and slope of substrate indicated. Provide membrane with not less than 90 percent solids, minimum 6-month shelf life in uncured state, and tested by manufacturer to comply with requirements of ASTM C 836.

1. Products: Subject to compliance with requirements, provide one of the following:

a. "A-H Seamless Membrane 1-R"; Anti Hydro Company.
b. "One-Kote System W-1"; Karnak Corporation.
c. "Vulkem 201"; Mameco International, Inc.
d. "Mult-I-Thane 3000"; Multi-Chemical Products, Inc.
e. "Perma-Guard (No. 7410 Series)"; The Neogard Corporation.
f. "Dekflex FST"; Nox-Crete, Inc.
g. "Elasto-Deck B.T."; Pacific Polymers, Inc.
h. "Duramem H-500/V-500"; Pecora Corporation.
i. "HLM 5000"; Sonneborn Building Products.
j. "Tremproof 60"; Tremco, Inc.

C. Hot, Rubberized-Asphalt, 1-Component Waterproofing: Single-component, rubberized-asphalt membrane system formulated for minimum 150-mil thick-coat application to substrate type and slope indicated, and complying with the following requirements:

1. Solids Content: 100 percent.
2. Low-Temperature Flexibility: No cracking, delamination, or adhesion loss when 1/8-inch thick membrane applied to aluminum substrate is subjected to 90-degree bend over 1/4-inch mandrel in one-second time period at minus 26 deg C (minus 15 deg F).
3. Water Resistance: No delamination, blistering, emulsion, or deterioration after 24 hrs. at 25 deg C (77 deg F); ASTM D 2939.
4. Water Vapor Permeability: 0.03 perms (0.017 metric perms) maximum for 1/8-inch-thick membrane at 38 deg C (100 deg F); ASTM E 96, Procedure E.
5. Water Absorption: Maximum 0.18 percent weight gain for 1/8-inch-thick membrane after 72 hrs. total immersion.
6. Service Temperature Range: 0 deg F to 120 deg F (minus 18 deg C to 49 deg C).
7. Products: Subject to compliance with requirements, provide one of the following:

a. "Liquid Membrane 6125"; American Hydrotech, Inc.
b. "Bakelite 790-11"; Bakelite Thermosets Limited.
c. "Ram-Tough, W.I. 250"; The Barrett Company.
d. "Tremproof 150"; Tremco, Inc.

D. Miscellaneous Materials: In addition to primary waterproofing materials, provide the following:

1. Primer/Filler/Sealer: As recommended by manufacturer of fluid-applied waterproofing compound.
2. Flashings, Cant Strips, and Accessories: As recommended by manufacturer of waterproofing compound.
3. Protection Course: Premolded, 1/8-inch-thick, semirigid board consisting of mineral-stabilized asphalt core sandwiched between layers of asphalt-saturated felt, surface-coated with asphalt and sealed to core under heat and pressure, and provided with polyethylene film facings.

a. Products: Subject to compliance with requirements, provide one of the following:

1) "Ram-Tough Protection Board"; The Barrett Company.
2) "PC-2 Protection Course"; W.R. Meadows, Inc.
3) "Protection Sheet"; Pecora Corp.
4) "Protection Course II"; Sonneborn Bldg. Products.
5) "Tremboard"; Tremco, Inc.

1.3 Execution:

A. Membrane Application, General: Comply with manufacturer's written application recommendations, including preparation of substrate surfaces, detail coatings of joints and planar changes in substrate, and priming of substrates.

1. Mix separately packaged components in accordance with manufacturer's written recommendations.
2. Apply waterproofing membrane material to substrates and adjoining surfaces indicated to receive membrane. Apply in accordance with manufacturer's recommendations to obtain thicknesses specified and using applicators and techniques best suited for slope and type of substrate to which applied.
3. If two-coat application is required to obtain membrane thickness specified below, apply second coat only after initial coat has cured as recommended by manufacturer.
4. Provide 180-mil (average) membrane thickness, with minimum 150-mil thickness.

B. Install sheet-type flashings and joint covers where indicated and as recommended by prime materials manufacturer. Extend flashings onto perpendicular surfaces and other work penetrating substrate to not less than 6 inches beyond finished surface to be applied over waterproofing.

C. Permit membrane to cure under conditions that will not contaminate or deteriorate waterproofing material. Block off traffic and protect membrane from physical damage.

D. Install protection course on cured membrane (after testing, if required) without delay to minimize period of membrane exposure.

1. On vertical surfaces, comply with waterproofing manufacturer's recommendations for adhesion of protection course to membrane.

E. In-Place Testing: Before completed membranes on horizontal surfaces are covered by protection course or other work, test for leaks with 2-inch depth of water maintained for 24 hours. Repair any leaks revealed by examination of substructure, and repeat test until no leakage is observed.

END OF SECTION 07120

SECTION 07210 - BUILDING INSULATION

1.1 General:

A. Thermal resistivity or "r-value" represents the reciprocal of thermal conductivity (k-value), which is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one sq. ft. per hour at mean temperatures indicated.

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

1. Division 6 Section "Air Infiltration Barrier"

B. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per ASTM E 119, ASTM E 84, and ASTM E 136, as applicable, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

C. Submittals: Submit product data for each form and type of insulation indicated.

1.2 Products:

A. General: Provide preformed units in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

B. Extruded Polystyrene Board Insulation: ASTM C 578, type as indicated below; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg F (4.4 and 23.9 deg C), respectively; and as follows:

1. Type V, 3.0 pcf min. density.
2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 75 and 450.

C. Unfaced, Flexible Glass Fiber Board Insulation: ASTM C 553, Class B-4 and ASTM C 612, Class 1; with nominal density of 1.5 pcf and r-value of 4.13 at 75 deg F (23.9 deg C), and maximum flame spread and smoke developed values of 25 and 50, respectively.

D. Foil-Faced, Flexible Glass Fiber Board Insulation: ASTM C 553, Class B-4 and ASTM C 612, Class 1; with nominal density of 1.5 pcf and r-value of 4.13 at 75 deg F (23.9 deg C); foil-scrim-kraft vapor-retarder facing on one side with maximum flame spread and smoke developed values of 25 and 50, respectively.

E. Unfaced Glass Fiber Board Insulation: ASTM C 612 for Class indicated; and as follows:

1. Low Density Semi-Rigid Board: Class 1, nominal density of 2.25 pcf, r-value of 4.3 at 75 deg F (23.9 deg C).

F. Foil-Faced Glass Fiber Board Insulation: ASTM C 612, Class as indicated below; foil-scrim-kraft vapor-retarder facing on one side with maximum flame spread and smoke developed values of 25 and 50, respectively; and as follows:

1. Low Density Semi-Rigid Board: Class 1, nominal density of 2.25 pcf, r-value of 4.3 at 75 deg F (23.9 deg C).

G. Foil-Kraft Laminate: Two layers of 0.0035-inch-thick aluminum foil laminated to an inner layer of 100-pound basic weight kraft paper, with maximum flame spread and smoke developed ratings of 20 and 10, respectively.

1. Product: Subject to compliance with requirements, provide "RX-2 Reflective Aluminum Foil Insulation," R-Fax Technologies, Inc.

H. Foil-Scrim-Polyethylene Laminate: Two layers of aluminum foil laminated with scrim reinforcing on polyethylene with an overall thickness of 7.5 mils, with maximum flame spread and smoke developed ratings of 5 and 10, respectively, in sheets 48 inches wide up to 375 feet long.

1. Product: Subject to compliance with requirements, provide "Foil-Ray DS Radiant Barrier," Energy Savers Imports, Inc.

I. Semi-Refractory Fiber Board Safing Insulation: Semi-rigid boards designed for use as a fire stop at openings between edge of slab and exterior wall panels, ASTM C 612, Class 1 and 2; nominal density of 4.0 pcf; passing ASTM E 136; r-value of 4.0 at 75 deg F (23.9 deg C).

1. Calking Compound: Material approved by manufacturer of safing insulation for sealing joint between foil backing of safing insulation and edge of concrete floor slab against penetration of smoke.
2. Safing Clips: Galvanized steel safing clips approved by manufacturer of safing insulation for holding safing insulation in place.

J. Polyethylene Vapor Retarder: ASTM D 4397, 6.0 mils thick, with a maximum permeance rating of 0.13 perms.

K. Tape for Vapor Retarder: Pressure sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

L. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation or mechanical anchors securely to substrates indicated without damaging or corroding either insulation, anchors, or substrates.

M. Adhesively Attached Pin Anchors: Perforated zinc-plated steel plate, 0.106 inch thick and 2 inches square, welded to projecting copper-coated, low-carbon steel pin, with mild steel self-locking washer, 0.016 inch thick of size required to hold insulation securely.

1. Where spindles will be exposed to human contact after installation, protect ends with capped self-locking washers.

1.3 Execution:

A. General: Comply with insulation manufacturer's instructions for installation of insulation.

B. Support insulation units by adhesive or mechanical anchorage or both as applicable to location and conditions indicated.

END OF SECTION 07210

SECTION 07241 – STUCCO FINISH COATING

1.1 General:

A. System in this section refers to Class PB insulation and finish systems consisting of an outer layer forming the protective finish coating to stucco. Supporting substrates are specified in other sections.

1. Class PB is the designation developed by the Exterior Insulation Manufacturers Association (EIMA).

B. Submittals: In addition to product data, submit the following:

1. Samples of protective finish coating for each finish, color, and texture indicated.

C. Installer Qualifications: Certified in writing by system manufacturer as qualified for installation of systems indicated.

D. Field-Constructed Mock-Up: Erect mock-ups for each finish required.

1.2 Products:

A. Manufacturers: Subject to compliance with requirements, provide of one of the following:

1. Bonsal; W.R. Bonsal Co.
2. Dryvit Systems, Inc.
3. ISPO USA, Inc.
4. Pleko Products, Inc.
5. Senergy Inc.
6. Simplex Div., Anthony Industries, Inc.
7. STO Industries, Inc.
8. TEC Inc., an H.B. Fuller Co.
9. Thoro System Products.
10. Vitricon Div., Polymer Plastics Corp.

B. Provide colors and texture of protective coating selected by Architect from manufacturer's full range of standard colors and textures.

C. Finish Coat Materials: System manufacturer's standard mixture complying with the following requirements:

1. Factory-mixed formulation of polymer emulsion admixture, colorfast mineral pigments, sound stone particles, and fillers. **Match ICI Paint Color 460 Arrow Wood.**

DI. Water: Clean and potable.

E. Elastomeric Sealants: Chemically curing, elastomeric sealant as listed and recommended by system manufacturer for use indicated, compatible with joint fillers, joint substrates, and other related materials, and complying with requirements of Division 7 Section "Joint Sealers" for products corresponding to description indicated below.

1. Multipart Nonsag Urethane Sealant.

1.3 Installation:

A. General: Comply with system manufacturer's current published instructions for installation of system as applicable to each type of substrate indicated.

B. Apply finish coat over dry base coat in thickness required by system manufacturer to produce a finish of uniform texture and color matching approved sample.

H. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements of Division 7 Section "Joint Sealers" and with "EIMA Joint Sealant Specification for Exterior Insulation and Finish Systems."

END OF SECTION 07241

SECTION 07320 - ROOF TILE

1.1 General:

A. System in this section refers to Clay tile roof system consisting of tile, fasteners, membrane and flashings. Supporting substrates are specified in other sections.

B. Related Sections:

1. Section 07530 - Elastomeric Sheet Roofing.
2. Section 07600 - Flashing and Sheet Metal.

A. Submittals: In addition to product data, submit the following:

1. Submit under provisions of Section 01300.
2. Product Data: Manufacturer's descriptive literature for products specified in this section.
3. Shop Drawings: Indicate the following:
    a. Roof tile:
        1. Exposure pattern.
        2. Locations and configurations of special shapes.
        3. Locations and configuration of each type roof flashing.
4. Selection Samples: Two sets of samples representing manufacturer's full range of available colors.
5. Verification Samples: Three full-size tile samples of each type tile specified, representing actual color and finish of products to be installed.
6. Manufacturer's printed installation instructions for each product, including product storage requirements.
7. Closeout Submittals: Warranty documents, issued and executed by tile manufacturer, countersigned by Contractor.

B. References:

1. ASTM A 167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
3. ASTM B 749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
4. ASTM C 67 - Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile.
5. ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
6. ASTM C 887 - Standard Specification for Packaged, Dry, Combined Materials for Surface Bonding Mortar.
7. ASTM C 920 - Standard Specification for Elastomeric Sealants.
8. ASTM C 1167 - Standard Specification for Clay Roof Tiles.
9. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
10. ASTM D 2626 - Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing.
11. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
12. SMACNA Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association, Inc.

C. Installer Qualifications: Certified in writing by system manufacturer as qualified for installation of systems indicated.

D. Field-Constructed Mock-Up: Erect mock-ups for each finish required.

1.2 Products:

A. Acceptable Tile Manufacturer:

1. Hanson Roof Tile, Tom Stahl, Sales Representative, 8800 West Buckeye Road Tolleson AZ 85353, Phone: 602-799-7171, Tom.Stahl@Hanson.biz
2. Gladding McBean LLC, 601 7th Street, Lincoln, CA, 95648, (Lynn Haines, Phone: 800-776-1133, lynn.haines@paccoast.com,) www.gladdingmcbean.com
3. Ludowici Roof Tile; P.O. Box 69, 4757 Tile Plant Road, New Lexington, OH 43764. ASD. Tel: (800) 945-8453. Email: ludowici@saint-gobain.com. www.ludowici.com.

B. Requests for substitution will be considered in accordance with provisions of Section 01600.

C. Unless otherwise specified for an individual product or material, supply all products specified in this section from the same manufacturer.

D. ROOF TILE

a. Mission / Pan and Cover Clay Roof Tile Type -A:
   1. Acceptable product: Straight Barrel Mission Tile.
      a. Profile: Barrel tile, pan and cover system.
      b. Pan and cover nominal length: 14-1/4 inches (362 mm).
      c. Pan and cover average exposure length: 15-3/8 inches (390 mm).
   2. Acceptable product: Tapered Mission Tile.
      a. Profile: Tapered barrel tile, pan and cover system.
      b. Pan and cover nominal length: 16 inches (406 mm).
      c. Pan and cover average exposure length: 13 inches (330 mm).
      d. Straight Pan: Cover-to-cover centerline width of 10 inches (254 mm).
      e. Tapered Pan: Cover-to-cover centerline width of 9-1/2 inches (241 mm).
      f. Pan and cover nominal length: 18-3/8 inches (466 mm).
      g. Pan and cover average exposure length: 15-3/8 inches (390 mm).
      h. Straight Pan: Cover-to-cover centerline width of 10 inches (254 mm).
      i. Tapered Pan: Cover-to-cover centerline width of 9-1/2 inches (241 mm).

b. Spanish Roof Tile Type -B:
   1. Acceptable product: 13-1/4 inch Spanish Tile.
      a. Profile: One-piece barrel tile.
      b. Nominal size: 9-3/4 inches (248 mm) wide by 13-1/4 inches (337 mm) long.
      c. Average exposure: 8-1/4 inches (209 mm) wide by 10-1/4 inches (260 mm) long.
   2. Acceptable product: 18-3/8 inch Spanish Tile.
      a. Profile: One-piece barrel tile.
      b. Nominal size: 9-3/4 inches (248 mm) wide by 18-3/8 inches (466 mm) long.
      c. Average exposure: 8-1/4 inches (209 mm) wide by 15-3/8 inches (390 mm) long.

a. Special Shapes and Fittings: Supply special shapes and fittings of same material and finish as adjacent tile, factory-formed before firing, as indicated on drawings or specified in manufacturer's instructions for project conditions including, but not limited to, the following:
   b. Hip caps.
   c. Ridge caps.

d. Rake edges.
e. Detached gable rake edges.
f. Eave edges
g. Valley edges.
h. Termination caps.
i. Half tile.
j. End Bands.

C. ACCESSORY MATERIALS

a. Underlayment: CertainTeed "Roofers' Select"; asphalt-impregnated fiberglass-reinforced organic felt designed for use on roof decks as a water-resistant layer beneath roofing shingles.
b. Underlayment: Asphalt-saturated organic felt conforming to ASTM D 226, Type II, non-perforated, nominal weight 30 pounds per 100 square feet (1.5 kg/sq m); two layers required.
c. Underlayment: Asphalt-saturated and coated organic felt conforming to ASTM D 2626, non-perforated, with fine mineral surfacing one side, nominal weight 43 pounds per 100 square feet (2.0 kg/sq m).
d. Waterproofing Membrane:
   1. Acceptable product: WinterGuard, manufactured by CertainTeed Corporation.
   2. Characteristics: Self-adhering rubberized asphalt membrane conforming to ASTM D 1970, with high traction surface, internal reinforcement, and split-back plastic release film.
e. Wood Stringers: S4S, maximum 19 percent moisture content, nominal 1 inch (25 mm) thick, of height required to support tile.
f. Flashing: Terne coated stainless steel; 0.015 inch (0.38 mm) thick stainless steel core material complying with ASTM A 167, Type 304; coated with 0.092 lb/sq ft (450 g/sq m) terne alloy on both sides of core metal.
g. Flashing: ASTM B 370 copper, cold rolled, 16 oz/sq ft (0.56 mm thick), natural finish.
h. Flashing: Lead sheet, 2.5 lb/sq ft (1 mm thick); complying with ASTM B 749.
i. Tile Fasteners: Corrosion-resistant; types and sizes specified in manufacturer's instructions for indicated uses and conditions.
j. Copper Wire: 18 gage (1.2 mm) minimum.
2. Cement Mortar for Setting Tile: 1 part Portland cement mortar ASTM C 270 Type M and 4 parts sand.

12. Grout for Finishing Rake and Eave Edges:
    i. Mix the following materials in equal parts:
       1. Factory-mixed mortar meeting requirements of ASTM C 387, Type N.
       2. Factory-mixed surface bonding mortar meeting requirements of ASTM C 887.
    i. Add mineral oxide pigment to match color of roof tile.
    ii. Add water and acrylic additive in accordance with mortar materials manufacturers' instructions to obtain correct mix for workability.
12. Roof Cement: Asphalt roof cement conforming to ASTM D 4586, Type I or II.
13. Sealant Used in Lieu of Flashing Cement: ASTM C 920 silicone; provide one of the following:
    i. Dow Corning 790 Silicone Building Sealant.
    ii. GE SilProof.
12. Screws: No. 8 or No. 9 brass or stainless steel, flathead Phillips or square drive, not less than 1-3/4 inches (45 mm) long.
13. Nails for Solid Wood Deck: Corrosion resistant copper, brass, or stainless steel; minimum 3/8 inch (9.5 mm) head diameter; shank of minimum 11 gage (3 mm) diameter and length sufficient to penetrate 3/4 inch (19 mm) into deck but not through the underside.

14. Nails for Plywood Sheathing: Slater's copper ring shank nail, 11 gage (3 mm), not less than 1-3/4 inches (45 mm) long with 3/8 inch (9.5 mm) head; point must penetrate through underside of deck.
15. Wood Nailers and Cant Strips: Preservative-treated wood, as specified in Section 06114.
16. Adhesive: OSI Pro-Series RT-600 Roof Tile Adhesive.
    i. Do not expose to ultraviolet rays.
    ii. Do not allow direct contact with waterproofing shingle underlayment.

C. FLASHING FABRICATION

a. Form flashing to profiles indicated on drawings and as required to protect roofing materials from physical damage and shed water and in accordance with manufacturer's instructions for indicated project conditions.

b. Form sections square and accurate in profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

c. Fabrication of other indicated sheet metal items is specified in Section 07600.

1.3 Installation:

2. DELIVERY, STORAGE, AND HANDLING
   a. Store products of this section in manufacturer's unopened packaging until installation.
   b. Maintain storage area conditions for products of this section in accordance with manufacturer's instructions until installation.
3. WARRANTY
   a. Special Warranty:
      1. The Contractor warrants products of this section, as installed, to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for a period of 3 years.
   b. Manufacturer's Warranty: Provide tile manufacturer's warranty against defects in product materials; warranty to include reimbursement for labor required for replacement of defective tiles for 20-year period, replacement of defective tile materials for 75-year period.
4. EXTRA MATERIALS
   a. Provide an additional quantity of roof tile matching tile installed, in the amount of 3 percent of the total installed, but not less than one full carton, for Owner's use in roof maintenance.

D. EXECUTION

1. EXAMINATION
   a. Verify that roofing penetrations and plumbing stacks are in place and properly flashed to deck surface.
   b. Verify that roof openings are correctly framed.
   c. Verify that deck surfaces are dry and free of ridges, warps, and voids.
   d. Installation in Alpine Conditions: Before application of roof tile in alpine conditions, plans must be pre-approved in writing by the Ludowici Technical Department (800-945-8453).

2. PREPARATION
   a. Comply with tile manufacturer's recommendations on preparation of acceptable roof deck.
   b. Broom clean deck surfaces prior to installation of underlayment.

3. PREPARATION
   a. Waterproofing Membrane:
      1. Adhere directly to deck, following membrane manufacturer's instructions.

2. Beginning at eave edge, install perpendicular to roof slope.
3. Overlap side joints minimum 4 inches (100 mm); overlap end joints minimum 4 inches (100 mm).
4. Install additional layer on rough surfaces; install additional layer of full-width membrane parallel to, and centered on, hips, ridges and valleys.
5. Do not permit plastic cement, or other petroleum solvent-based cements, to come in contact with waterproofing membrane.

b. Underlayment:
1. Beginning at eave edge, install perpendicular to roof slope; extend minimum of 4 inches (100 mm) over gutters and valley flashing, and minimum 6 inches (150 mm) up abutting vertical surfaces.
2. Overlap side joints minimum 2-1/2 inches (64 mm); overlap end joints minimum 6 inches (150 mm).
3. Install additional layer on rough surfaces; install additional layer of full-width underlayment parallel to, and centered on, hips, ridges and valleys.
4. Fasten sides and ends to deck with fasteners spaced at maximum 6 inches (150 mm) on centers.

c. Install flashing at all locations where roof intersects other roofs, sidewall or parapet walls, chimneys, ventilators, and similar projections, and at gable edges.
1. Lap underlayment over edges of flashing 4 inches (100 mm).

d. Intersections of Roof Surfaces and Abutting Vertical Surfaces:
1. Install continuous 12 inch (304 mm) wide strips of waterproof membrane material to extend 9 inches (228 mm) across roof deck and 3 inches (76 mm) up vertical surface.
2. Install continuous metal flashing to extend 3 inches (76 mm) up vertical surface.
3. At locations where vertical surface will abut top edge of tile, install metal flashing to extend 3 inches (76 mm) up vertical surface, form metal flashing to extend minimum 3 inches (76 mm) over tile, and form 1/2 inch (12 mm) return hem at edge of metal.
4. Form saddle flashings for protrusions through roof in accordance with manufacturer's instructions.

e. Fabricated Sheet Metal Items: Install in accordance with shop drawings and SMACNA ASMM.

f. Cant Strip: Install nominal 1 inch by 2 inches by 48 inches (25 mm by 50 mm by 1220 mm) wood cant strips at eaves. Apply eave flashing and underlayment over cant strip.

g. Cant Strip: Install nominal 1 inch by 2 inches by 48 inches (25 mm by 50 mm by 1220 mm) pressure-treated wood cant strips directly over underlayment at eaves, spacing 1 inch (25 mm) apart for drainage.

h. Nailers: Install nominal 1 inch by 2 inches by 48 inches (25 mm by 50 mm by 1220 mm) pressure-treated wood nailers as detailed at ridge and hips, directly over underlayment. Protect with additional layer of WinterGuard before installing hip and ridge accessory.

4. TILE INSTALLATION
a. Install tile roofing in strict conformance with manufacturer's instructions.
b. Install first course over cant strip, with overhang.
1. Do not drive fasteners tightly against tiles, to reduce risk of breakage and to allow natural deck movement.
2. Allow tile to "hang" on its fasteners.
3. Provide 3/4 inch (19 mm) to 2 inches (51 mm) overhang, permitting proper flow into gutters.
4. Provide not more than 1/2 inch (13 mm) overhang, unless gutters are in place. If gutters are used, provide just enough overhang to permit proper flow into gutters; provide under-eave tile course or heavy-gage drip edge with extended hemmed lip to reinforce strength of overhang.

c. Install each subsequent course with joints centered on tile below, with maximum exposure in each course of 13-1/4 inches (336 mm). Wet cut tile at hips and valleys, using masonry saw with diamond blade.

d. At hip and ridge, and on mansard roofs, install bead of adhesive at butt end of each tile, located so it is completely concealed. Install sealant as required at hip and ridge accessories to achieve watertight installation.

5. PROTECTION

a. Do not permit traffic over finished roof surface unless absolutely necessary.

b. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the "butt" of the tile in order to avoid breakage.

c. Replace tile broken due to improper protection or traffic control.

END OF SECTION 07320

SECTION 07530 - SINGLE-PLY MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes single-ply membrane roofing systems.

B. Types of roofing systems specified in this Section using single-ply roofing membranes include the following:
   1. Totally adhered systems.

C. Single-ply roofing membranes include the following:

   1. Ethylene propylene diene monomer (EPDM).

D. Roof insulation related to single-ply membrane roofing is specified in this Section.

E. Wood nailers, blocking, and other related items are specified in Division 6.

F. Similar membranes concealed by a wearing surface are excluded by definition and, if required, are specified elsewhere in another Division 7 Section.

G. Copings and gravel stops are specified in another Division 7 Section.

1.3 SUBMITTALS

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

B. Product data, installation instructions, and general recommendations from manufacturer of single-ply membrane system for types of roofing required. Include data substantiating that materials comply with requirements.

C. Samples of finished roofing sheets, including T-shaped side/end-lap seam. Also include the following:

   1. Insulation board.
   2. Indicate layout of tapered insulation materials.

D. Pre-roofing conference records.

E. Test data for pullout resistance of fastening systems.

F. Certification that materials comply with local VOC limitations.

1.4 QUALITY ASSURANCE

A. Manufacturer: Obtain primary single-ply membrane roofing from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.

B. Installer: Engage an experienced Installer that has specialized in installing roofing systems similar to those required for this Project. Installer must be acceptable to or licensed by manufacturer of primary roofing material.

1. Work associated with single-ply membrane roofing, including (but not limited to) insulation, flashing, and membrane sheet joint sealers, is to be performed by Installer of this Work.

C. UL Listing: Provide labeled materials that have been tested and listed by UL in "Building Materials Directory" or by other nationally recognized testing laboratory for Class A rated materials/system.

1.5 PROJECT CONDITIONS

A. Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

B. Substrate Conditions: Do not begin roofing installation until substrates have been inspected and are determined to be in satisfactory condition.

1.6 WARRANTY

A. Manufacturer's Warranty: Submit executed copy of single-ply membrane manufacturer's "Limited Service Warranty" agreement including flashing endorsement, signed by an authorized representative of manufacturer. Provide form that was published with product literature as of date of Contract Documents.

B. Warranty Period: 10 years from date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

A. Performance: Provide roofing materials identified to be of generic type indicated and tested to show compliance with required performances.

B. Compatibility: Provide products recommended by manufacturers to be fully compatible with indicated substrates. Provide separation materials as required to eliminate contact between incompatible materials.

2.2 EPDM MEMBRANE

A. General: Ethylene propylene diene monomers formed into uniform, flexible sheets, complying with ASTM D 4637, Type 1.

1. Class U: Unreinforced.
2. Class SR: Scrim or fabric internal reinforced.
3. Thickness: 60 mils (1.5 mm), nominal.
4. Exposed Face Color: White.

B. Fully Adhered EPDM Membrane: Manufacturer's standard installation.

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

a. Carlisle Syntec Systems.
b. Celotex Corp.
c. ERACORP.
d. Firestone Building Products Co.
e. GenFlex Roofing Systems, GenCorp Polymer Products.
f. Kelly Energy Systems, Inc.
g. Manville Building Materials Corp.
h. Versico Inc.

2.5 AUXILIARY MATERIALS

A. Sheet Seaming System: Manufacturer's standard materials for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by membrane manufacturer.

B. Cant Strips, Tapered Edge Strips, and Flashing Accessories: Types recommended by membrane manufacturer, including adhesive tapes, flashing cements, and sealants.

C. Flashing Material: Manufacturer's standard system compatible with single-ply membrane.

D. Slip Sheet: Type recommended by membrane manufacturer for protecting membrane from incompatible substrates (If required by manufacturer).

E. Membrane Adhesive: As recommended by membrane manufacturer for particular substrate and project conditions, formulated to withstand minimum 60-psf (2870 Pa) uplift force.

1. Provide adhesives that comply with local requirements limiting amounts of volatile organic compounds.

2.6 INSULATING MATERIALS

A. General: Provide insulating materials to comply with requirements indicated for materials and with referenced standards in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

1. Provide tapered boards where indicated for sloping to drain. Fabricate with taper of 1/4 inch per foot (6 mm per 300 mm), unless otherwise indicated.

B. Extruded-Polystyrene Board Insulation: Rigid, cellular, thermal insulation with closed cells and integral high-density skin, complying with ASTM C 578 for Type indicated; with 5-year aged r-

values of 5.4 and 5.0 (rSI-values of 0.95 and 0.88 for 25.4 mm) at 40 and 75 deg F (4 and 24 deg C), respectively, and as follows:

1. Type IV, 1.6-pcf (25-kg/cu.m) minimum density, unless otherwise indicated.

    a. Surface Burning Characteristics: Maximum flame-spread and smoke-developed values of 5 and 165, respectively.

C. Molded-Polystyrene Board Insulation: Rigid, cellular, thermal insulation formed by the expansion of polystyrene resin beads or granules in a closed mold to comply with ASTM C 578 for Type indicated and as follows:

1. Type II, 1.35-pcf (22-kg/cu.m) minimum density, aged r-value of 4.4 and 4.0 (rSI-value of 0.77 and 0.70 for 25.4 mm) at 40 and 75 deg F (4 and 24 deg C), respectively.
2. Type VIII, 1.15-pcf (18-kg/cu.m) minimum density, aged r-value of 4.2 and 3.8 (rSI-value of 0.74 and 0.67 for 25.4 mm) at 40 and 75 deg F (4 and 24 deg C), respectively.
3. Type X, 1.35-pcf (22-kg/cu.m) minimum density, aged r-value of 5.4 and 5.0 (rSI-value of 0.95 and 0.88 for 25.4 mm) at 40 and 75 deg F (4 and 24 deg C), respectively.

    a. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed values of 75 and 175, respectively.

D. Cellular-Glass Board Roof Insulation: Roof boards composed of multiple sections of rigid flat cellular-glass block with kraft-paper sheet facings laminated to both sides with asphalt; complying with ASTM C 552, Type IV; 24 inches (600 mm) wide by 48 inches (1200 mm) long, passing ASTM E 136 for combustion characteristics of unfaced board; with r-values of 3.03 and 2.86 (rSI-values of 0.53 and 0.50 for 25.4 mm) at 50 and 75 deg F (10 and 24 deg C), respectively.

E. Cellular-Glass Board Roof Insulation: Roof boards composed of multiple sections of rigid flat cellular-glass block with kraft-paper sheet facings laminated to both sides with asphalt; complying with ASTM C 552, Type IV; 24 inches (610 mm) wide by 48 inches (1220 mm) long, passing ASTM E 136 for combustion characteristics of unfaced board; with r-values of 3.03 and 2.86 (rSI-values of 0.53 and 0.50) for 1 inch (25.4 mm) at 50 and 75 deg F (10 and 24 deg C), respectively.

F. Glass-Fiber Board Roof Insulation: Thermal insulation produced by combining glass fibers with thermosetting resin binders and faced one side with asphalt and kraft paper to comply with ASTM C 726; r-values of 2.8 to 12.5 (rSI-values of 0.49 to 2.20 for 25.4 mm), depending on thickness, at 75 deg F (24 deg C).

G. Perlite Board Roof Insulation: Rigid boards produced by combining expanded perlite and fibers with binders, coated or impregnated one side, to comply with ASTM C 728; r-value of 2.78 (rSI-value of 0.49 for 25.4 mm) at 75 deg F (24 deg C).

H. Phenolic Board Roof Insulation: Rigid, cellular, thermal insulation with thermoset phenolic-based, closed-cell foam core and fiberglass facer sheets laminated to both sides; complying with the following requirements for minimum physical properties, unless otherwise indicated, measured per ASTM test method referenced with each property:

1. Compressive Strength: 25 psi (1725 Pa) per ASTM D 1621, Procedure A (at 10 percent deformation).
2. Dimensional Stability: Less than 1.0 percent change in length, width and thickness per ASTM D 2126, Procedure C.
3. Water Absorption: Maximum change in volume of 2.0 percent per ASTM C 272 after 2-hour immersion.

4. Density: 2.5 pcf (40 kg/cu.m) per ASTM D 1622.
5. Thermal Resistivity: r-value of 8.33 (rSI-value of 1.47 for 25.4 mm) per ASTM C 518.
6. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed values of 35 or less.

I. Perlite/Polyisocyanurate Composite Board Roof Insulation: Rigid thermal composite insulation with polyisocyanurate closed-cell foam core with rigid perlite board laminated to one side and manufacturer's standard facing laminated to other side; complying with FS HH-I-1972/3, Class 1.

J. Polyisocyanurate Board Roof Insulation: Rigid, cellular, thermal insulation with polyisocyanurate closed-cell foam core and manufacturer's standard facing laminated to both sides; complying with FS HH-I-1972/2, Class 1.

2.7 AUXILIARY INSULATION MATERIALS

A. Adhesive for Bonding Insulation: Type recommended by insulation manufacturer and complying with fire-resistance requirements.

B. Mastic Sealer: Type recommended by insulation manufacturer for bonding edge joints and filling voids.

C. Mechanical Anchors: Corrosion-resistant type as recommended by insulation manufacturer for deck type and complying with fire and insurance wind-uplift rating requirements.

1. Provide system tested and approved for I-90 wind-uplift rating.

PART 3 - EXECUTION

3.1 PREPARING SUBSTRATE

A. General: Comply with manufacturers' instructions to prepare substrate to receive single-ply membrane system.

1. Verify that penetrations, expansion joints, and blocking are in place and secured and that roof drains are properly clamped into position.

B. Clean substrate of dust, debris, and other substances detrimental to single-ply system installation. Remove sharp projections.

C. Install cant strips, flashings, and accessory items as shown and as recommended by manufacturer.

D. Prime substrate where recommended by manufacturer of materials being installed.

E. On wood board decks to receive bituminous materials, install nailed course of paper slip sheet.

F. Prevent compounds from entering and clogging drains and conductors and from spilling or migrating onto surfaces of other work.

3.2 INSTALLING INSULATION

A. General: Extend insulation full thickness in two layers, or in multiple layers over entire surface to be insulated, cutting and fitting tightly around obstructions. Form cant strips, crickets, saddles,

and tapered areas with additional material as shown and as required for proper drainage of membrane.

1. Stagger joints in one direction for each course. For multiple layers, stagger joints in both directions between courses with no gaps, to form a complete thermal envelope.
2. Provide tapered units to suit drainage pattern indicated.

B. Do not install more insulation in a day than can be covered with membrane before end of day or before start of inclement weather.

C. Provide protection sheet between insulation and membrane when recommended by membrane manufacturer.

3.3 INSTALLING MEMBRANE

A. General: Start installation only in presence of manufacturer's technical representative, IF REQUIRED BY MANUFACTURER FOR WARRANTY.

1. Cut out and repair membrane defects at the end of each day's work.

B. Fully Adhered Membrane: Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by manufacturer. Apply adhesive to surfaces to be bonded and roll into place when adhesive has properly cured. Treat seams with special adhesive and apply sealant to exposed sheet edges, tapering application as recommended by manufacturer. Install mechanical fasteners, flashings and counterflashings, and accessories at locations and as recommended by manufacturer.

3.4 PROTECTING ROOFING

A. After completing roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage found.

B. Repair or replace (as required) deteriorated or defective work found at the time of final inspection to a condition free of damage and deterioration at the time of Substantial Completion and according to the requirements of the specified warranty.

END OF SECTION 07530

SECTION 07720 - ROOF ACCESSORIES

1.1 GENERAL

A. Submittals: Per Conditions of Contract and Division 1.

B. Product data for each type of product specified.

C. Shop drawings showing fabrication and installation of each roof accessory specified.

D. Samples representing color, texture, shape, and sizes of each roof accessory specified.

1.2 PRODUCTS

A. Prefabricated Curbs and Equipment Supports: Comply with loading and strength requirements for units supporting other work. Coordinate with equipment to be supported.

1. Fabricate of structural-quality, hot-dip galvanized or galvalume sheet steel, factory-primed and prepared for painting with welded or sealed mechanical corner joints.
2. Provide complete with cant strips and base profile coordinated with roof insulation thickness. Provide preservative-treated wood nailers at tops of curbs, coordinate with thickness of insulation and roof flashing as indicated, tapered as necessary to compensate for roof deck slopes.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Curbs, Inc.
    b. Custom Curb, Inc.
    c. The Pate Co.
    d. Roof Products and Systems Corp.
    e. ThyCurb Div./ThyBar Corp.

B. Roof Hatches: Fabricate units to withstand 40-lbf per sq. ft. external loading and 20-lbf per sq. ft. internal loading pressure. Frame with 9-inch-high integral-curb double-wall construction with 1-1/2-inch insulation, cant strips and cap flashing (roofing counterflashing) with welded or sealed mechanical corner joints. Provide double-wall cover (lid) construction with 1-inch insulation core. Provide gasketing and equip corrosion-resistant or hot-dip galvanized hardware including pintle hinges, hold-open devices, interior padlock hasps, and both interior and exterior latch handles.

1. Single-Leaf Type: For personnel access.

    a. For Ladder Access: 2 feet 6 inches by 3 feet 0 inch.
2. Material: Zinc-coated steel sheets.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Babcock-Davis Hatchways, Inc.
    b. Bilco Co.
    c. Bristolite Skylights.
    d. Dur-Red Products.
    e. Hillsdale Industries.
    f. Milcor, Inc.
    g. Naturalite/EPI Skylight Systems.
    h. O'Keeffe's, Inc.

i. Plasteco, Inc.
j. Plasticrafts, Inc.
k. ThyCurb Div./ThyBar Corp.
l. Wasco Products, Inc.

C. Ridge Vents: Manufacturer's standard product.

1. Aluminum: Fabricate of sheet aluminum with baffles to prevent snow and rain entering and weep holes to allow water to drain to roof. Provide splice plates and end caps required.
2. Plastic: High-density polypropylene or other UV-stabilized plastic designed to be installed under shingles at ridge.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Air Vent, Inc.
b. Alcoa Building Products.
c. Ampcor, Div. of The Solar Group.
d. ThyCurb Div./ThyBar Corp.

D. Finishes, General: Comply with NAAMM "Metal Finishes Manual" for recommendations on application and designations of finishes.

E. Baked Enamel Finish: Thermosetting-modified acrylic enamel primer and topcoat system complying with AAMA 603.8, except with a minimum dry film thickness of 1.5 mils, medium gloss.

1. Color: Match Architect's samples.
2. Color: As selected by Architect.

N. Fluoropolymer Coating System: Manufacturer's standard two-coat thermocured system, composed of inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene resin by weight, complying with AAMA 605.2.

1. Color and Gloss: Match Architect's sample.
2. Color and Gloss: As selected by Architect.

1.3 EXECUTION

A. Installation: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units. Coordinate with vapor barriers, roof insulation, roofing and flashing installation to ensure that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.

1. Except as otherwise indicated, install roof accessory items according to construction details of NRCA "Roofing and Waterproofing Manual."

B. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07720

SECTION 07901 - JOINT SEALANTS

1.1 GENERAL

A. Submittals: In addition to product data submit the following:

1. Samples of each type and color of joint sealant required.

1.2 PRODUCTS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

B. Colors: Provide color indicated of exposed joint sealants or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated complying with ASTM C 920 requirements.

1. Two-Part, Nonsag Polysulfide Sealant: Type M; Grade NS; Class 12-1/2; Uses NT, M, G, A, and O.
2. One-Part, Nonsag Polysulfide Sealant: Type S; Grade NS; Class 12-1/2; Uses T,
3. Multi-Part, Neutral-Curing Silicone Sealant: Type M; Grade NS; Class 25; Uses T, NT,
9. Multi-Part, Nonsag Urethane Sealant for Use NT: Type M, Grade NS, Class 25, and as follows:

a. Uses T, NT, M, G, A, and O.

D. Acrylic Sealant: One-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230, or both, with capability, when tested per ASTM C 719, to withstand the following percentage change in joint width existing at time of application without failing adhesively or cohesively:

1. Maximum cyclic movement capability: plus or minus 7.5 percent.

E. Butyl Sealant: Manufacturer's standard one-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with ASTM C 1085 and formulated with minimum of 75 percent solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

F. Acrylic-Emulsion Sealant: One-part, nonsag, mildew-resistant, paintable, acrylic-emulsion sealant complying with ASTM C 834.

G. Silicone-Emulsion Sealant: Product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920, that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.

H. Acoustical Sealant: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.

L. Sealant Backings, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of plastic foam of material indicated below, and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

a. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.

2. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to -26 deg F (-32 deg C).
3. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back of joint.

M. Primer: As recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

1.3 EXECUTION

A. General: Comply with joint sealant manufacturer's instructions applicable to products and applications indicated.

B. Sealant Installation Standard: Comply with ASTM C 1193.

C. Acoustical Sealant Application Standard: Comply with ASTM C 919 for use of joint sealants in acoustical applications.

END OF SECTION 07901

SECTION 08110 - STEEL DOORS AND FRAMES

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 steel doors and frames.

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

1. Division 4 Section "Unit Masonry" for building anchors into and grouting frames in masonry construction.
2. Division 8 Section "Flush Wood Doors" for hollow-core and solid-core wood doors installed in steel frames.
3. Division 8 Section "Door Hardware" for door hardware and weatherstripping.
4. Division 8 Section "Glazing" for glass in steel doors and sidelights.
5. Division 9 Section "Gypsum Board Assemblies" for spot grouting frames in gypsum board partitions.
6. Division 9 Section "Painting" for field painting primed doors and frames.

1.3 SUBMITTALS

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

B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.

1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

E. Samples for initial selection in the form of manufacturer's color charts showing the full range of colors available for factory-finished doors and frames.

1.4 QUALITY ASSURANCE

A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Temperature-Rise Rating: Where indicated, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Steel Doors and Frames:

a. Amweld Building Products, Inc.
b. Benchmark Commercial Doors.
c. Ceco Door Products.
d. Copco Door Co.
e. Curries Co.
f. Deansteel Manufacturing Co.
g. Fenestra Corp.
h. Kewanee Corp.
i. Mesker Door, Inc.
j. Pioneer Industries.
k. Republic Builders Products.
l. Steelcraft.

2. Prefinished Interior Steel Frames:

a. Dunbarton Corp. (Rediframe Products).
b. Timely Industries.

2.2 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).

B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.

C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 (ASTM A 526M), commercial quality, or ASTM A 642 (ASTM A 642M), drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G 60 (ASTM A 525M, with Z 180 or ZF 180) coating designation, mill phosphatized.

D. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:

1. Interior Doors: Grade I, standard-duty, Model 1, full flush design, minimum 0.0359-inch- (0.9-mm-) thick cold-rolled steel sheet faces.
2. Exterior Doors: Grade II, heavy-duty, Model 1, full flush design, minimum 0.0516-inch- (1.3-mm-) thick galvanized steel sheet faces.

B. Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- (0.6-mm-) thick cold-rolled steel sheet set into minimum 0.0359-inch- (0.9-mm-) thick steel frame.

1. Sight-Proof Louvers: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.

2.4 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet.

1. Fabricate frames with mitered or coped corners, continuously welded construction for exterior applications and knocked down for field assembly at interior applications.
2. Fabricate frames for interior openings over 48 inches (1220 mm) wide from 0.0598-inch- (1.5-mm-) thick steel sheet.
3. Fabricate exterior frames for openings over 48 inches (1220 mm) wide from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

C. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
   a. Resin-impregnated paper honeycomb.
   b. Rigid polyurethane conforming to ASTM C 591.
   c. Rigid polystyrene conforming to ASTM C 578.
   d. Unitized steel grid.
   e. Vertical steel stiffeners.
   f. Rigid mineral fiber with internal sound deadener on inside of face sheets.

2. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors. Not more than 3/4 inch (19 mm) at bottom.

   a. Fire Doors: Provide clearances according to NFPA 80.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

E. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

1. At exterior locations.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.

1. Unless otherwise indicated, provide thermal-rated assemblies with U-value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better.

H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

J. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

K. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.

1. Provide nonremovable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.

C. Apply primers and organic finishes to doors and frames after fabrication.

2.7 GALVANIZED STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating 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 galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

C. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil (0.0254 mm) for topcoat. Comply with paint manufacturer's instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.0508 mm).

1. Color and Gloss: As indicated by manufacturer's color and gloss designations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
2. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
3. In in-place gypsum board partitions, install knock-down, slip-on, drywall frames.
4. Install fire-rated frames according to NFPA 80.

C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.

1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
2. Smoke-Control Doors: Comply with NFPA 105.

3.2 ADJUSTING AND CLEANING

A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08110

SECTION 08410 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of aluminum entrance and storefront work:
1. Exterior entrance doors.
2. All hardware, including locksets
3. Sidelights.
4. Frames for entrances.
5. Storefront-type framing system.

B. Related Sections: The following sections contain requirements that relate to this Section:
1. Glazing requirements for aluminum entrances and storefront, including entrances specified to be factory glazed, are included in Division 8 Section "Glass and Glazing."
2. Lock cylinders are included in Division 8 Section "Finish Hardware."

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide aluminum entrance and storefront assemblies that comply with performance characteristics specified, as demonstrated by testing the manufacturer's corresponding stock assemblies according to test methods indicated.

B. Thermal Movement: Design the aluminum entrance and storefront framing systems to provide for expansion and contraction of the component materials. Entrance doors shall function normally over the specified temperature range.

1. The system shall be capable of withstanding a metal surface temperature range of 180 deg F (100 deg C) without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.

C. Design Requirements: Provide aluminum entrance and storefront systems that comply with structural performance, air infiltration, and water penetration requirements indicated.

1. Wind Loads: Provide aluminum entrance and storefront assemblies capable of withstanding wind pressures of 20 psf (958 Pa) inward and 20 psf (958 Pa) outward acting normal to the plane of the wall.

D. Structural Performance: Conduct tests for structural performance in accordance with ASTM E 330. At the conclusion of the tests there shall be no glass breakage or permanent damage to fasteners, anchors, hardware or actuating mechanism. Framing members shall have no permanent deformation in excess of 0.2 percent of their clear span.

1. Deflection Normal to the Plane of the Wall: Test pressure required to measure deflection of framing members normal to the plane of the wall shall be equivalent to the wind load

specified above. Deflection shall not exceed 1/360 of the clear span, when subjected to uniform load deflection test.

2. Deflection Parallel to the Plane of the Wall: Test pressures required to measure deflection parallel to the plane of the wall shall be equal to 1.5 times the wind pressures specified above. Deflection of any member carrying its full dead load shall not exceed an amount that will reduce glass bite below 75 percent of the design dimension and shall not reduce the edge clearance between the member and the fixed panel, glass or other fixed member above to less than 1/8 inch (3 mm). The clearance between the member and an operable door or window shall be at least 1/16 inch (1.6 mm).

E. Air Infiltration: Provide aluminum entrance and storefront framing system with an air infiltration rate of not more than 0.06 cfm per sq. ft. (0.3 L/s x sq. m) of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.57 psf (75 Pa).

F. Water Penetration: Provide framing systems with no uncontrolled water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf per sq. ft. (299 Pa).

G. Condensation Resistance: Where framing systems are "thermal-break" construction, provide units tested for thermal performance in accordance with AAMA 1503 showing condensation resistance factor (CRF) of not less than 45.

H. Thermal Transmittance: Provide framing systems that have an overall U-value of not more than 0.65 BTU/hr x sq. ft. x deg F (3.7 W/sq. m x K) at 15 mph (24 kph) exterior wind velocity when tested in accordance with AAMA 1503.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

1. Product data for each aluminum entrance and storefront system required, including:

   a. Manufacturer's standard details and fabrication methods.
   b. Data on finishing, hardware and accessories.
   c. Recommendations for maintenance and cleaning of exterior surfaces.

2. Shop drawings for each aluminum entrance and storefront system required, including:

   a. Layout and installation details, including relationship to adjacent work.
   b. Elevations at 1/4 inch = 1 foot (1:50) scale.
   c. Detail sections of typical composite members.
   d. Anchors and reinforcement.
   e. Hardware mounting heights.
   f. Provisions for expansion and contraction.
   g. Glazing details.

3. Hardware Schedule: Submit complete hardware schedule organized into sets based on hardware specified. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Include item name, name of the manufacturer and complete designations of every item required for each door opening.
4. Test Reports: Provide certified test reports from a qualified independent testing laboratory showing that aluminum entrance and storefront systems have been tested in

accordance with specified test procedures and comply with performance characteristics indicated.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Provide aluminum entrances and storefront systems produced by a firm experienced in manufacturing systems that are similar to those indicated for this project and that have a record of successful in-service performance.

B. Single Source Responsibility: Obtain aluminum entrance and storefront systems from one source and from a single manufacturer.

C. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum entrance and storefront work required and are based on the specific types and models indicated. Aluminum entrance and storefront by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum entrance and storefront components in the manufacturer's original protective packaging.

B. Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air.

1. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.7 PROJECT CONDITIONS

A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.

1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.8 WARRANTY

A. Warranty: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:

1. Structural failures including excessive deflection, excessive leakage or air infiltration.
2. Faulty operation.
3. Deterioration of metals, metal finishes and other materials beyond normal weathering.

B. Warranty Period: 3 years after the date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide entrance and storefront systems manufactured by one of the following:

1. Kawneer Company, Inc.
2. Atlas Architectural Metals, Inc.
3. CMI-Cronstroms Mfg. Inc.
4. Dawson Metal Company, Inc.
5. EFCO Corporation.
6. Amarlite Architectural Products.
7. Portal, Inc.
8. PPG Industries.
9. Rebco, Inc.
10. Tubelite Division of Indal, Inc.
11. United States Aluminum Corp.
12. Vistawall Architectural Products.

2.2 MATERIALS

A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 (ASTM B 221M) for aluminum extrusions, ASTM B 209 (ASTM B 209M) for aluminum sheet or plate, and ASTM B 211 (ASTM B 211M) for aluminum bars, rods and wire.

B. Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 (ASTM A 36M) for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 (ASTM A 570M) for hot rolled sheet and strip.

C. Glass and Glazing Materials: Comply with requirements of "Glass and Glazing" section of these specifications.

D. Panel Core Material: Resin-impregnated Kraft paper honeycomb.

E. Panel Core Material: Rigid, closed-cell polyurethane insulation.

F. Panel Core Material: Rigid, noncombustible mineral insulation board.

G. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, zinc plated steel, or other material warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.

1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches (3.2 mm) thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.

2. Exposed Fasteners: Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws that match the finish of member or hardware being fastened.

H. Concealed Flashing: 0.0179-inch (0.5-mm) minimum dead-soft stainless steel, or 0.026-inch (0.7-mm) thick minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.

I. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.

J. Concrete and Masonry Inserts: Provide cast iron, malleable iron, or hot-dip galvanized steel inserts complying with ASTM A 123.

K. Compression Weatherstripping: Manufacturer's standard replaceable compressible weatherstripping gaskets of molded neoprene complying with ASTM D 2000 or molded PVC complying with ASTM D 2287.

L. Sliding Weatherstripping: Manufacturer's standard replaceable weatherstripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing, complying with AAMA 701.2.

2.3 HARDWARE

A. General: Refer to Division 8 Section "Finish Hardware" for requirements for hardware items other than those indicated to be provided by the aluminum entrance manufacturer.

B. Provide heavy-duty hardware units as indicated, scheduled, or required for operation of each door, including the following items of sizes, number, and type recommended by manufacturer for service required; finish to match door.

1. Offset Pivot Sets: Comply with ANSI A156.4, Grade 1. Provide exposed parts of cast aluminum alloy. Provide an intermediate pivot for doors over 90 inches (2286 mm) high.
2. Center Pivot Sets: Comply with ANSI A156.4, Grade 1. Provide exposed parts of cast aluminum alloy.
3. Ball-Bearing Butts: 5-knuckle, 2-bearings, steel ball bearing butts sized to comply with ANSI A156.1, Grade 1. Provide 2 butts for doors 90 inches (2286 mm) or less; provide 3 butts for taller and heavier doors.
4. Surface-Mounted Overhead Closers: Modern type with cover, for parallel-arm-type mounting installation. Comply with ANSI A156.4, Grade 1. Comply with manufacturer's recommendations for closer size, depending on door size, exposure to weather and anticipated frequency of use. Include the following:
    a. Hold-open arm.
    b. Delayed-action closing.
5. Concealed Overhead Holders: Adjustable, shock-absorbing type concealed overhead holders; comply with ANSI A156.8.
6. Exposed Overhead Holders: Streamlined type, exposed overhead holders for use on single-acting doors; comply with ANSI A156.8.
6. Door Stop: Floor- or wall-mounted door stop, as appropriate, with integral rubber bumper; comply with ANSI A156.16, Grade 1.
7. Cylinders: Mortise type, 6-pin tumbler, inside cylinder units with cast aluminum face; comply with ANSI A156.5, Grade 1.

8. Deadlocks: Mortised maximum security deadlock, with minimum 1-inch (25-mm) long pivoted bolt and stainless steel strike box; comply with ANSI A156.5, Grade 1.
9. Lever Handles: Cast aluminum alloy inside lever handle units.
10. Panic Hardware: Mortise-type, center latch bolt type panic exit device activated by a full-width crash bar. Comply with UL 305.
31. Push-Pull Plates: Aluminum push-pull plates of style indicated.
32. Pull Handles: Aluminum pull handles of style indicated.
33. Push Bars: Manufacturer's standard full-door-width single-bar push bar.
34. Thresholds: Extruded aluminum threshold of size and design indicated in mill finish, complete with anchors and clips, coordinated with pivots and floor-concealed closers.

2.4 COMPONENTS

A. Storefront Framing System: Provide storefront and entrance framing systems fabricated from extruded aluminum members of size and profile indicated. Include subframes and other reinforcing members of the type indicated. Provide for flush glazing storefront from the exterior on all sides without projecting stops. Shop-fabricate and preassemble frame components where possible. Provide storefront frame sections without exposed seams.

1. Mullion Configurations: Provide pockets at the inside glazing face to receive resilient elastomeric glazing. Mullions and horizontals shall be one piece. Make provisions to drain moisture accumulation to the exterior.

2. Infill Panels: Provide flush-laminated infill panels of thickness indicated, fabricated with panel core material laminated with waterproof glue between two sheets of aluminum.

B. Stile-and-Rail Type Entrance Doors: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.

1. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for nonremoval.
2. Design: Provide 1-3/4-inch (44-mm) thick doors of design indicated.

    a. Medium stile (3-1/2-inch (89-mm) nominal width).

2.5 FABRICATION

A. General: Fabricate aluminum entrance and storefront components to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated, with maximum and minimum dimensions required, to achieve design requirements and coordination with other work.

1. Thermal-Break Construction: Fabricate storefront framing system with an integrally concealed, low-conductance thermal barrier, located between exterior materials and exposed interior members to eliminate direct metal-to-metal contact. Use manufacturer's standard construction that has been in use for similar projects for period of not less than 3 years.

B. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.

1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.
2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
3. Preglaze door and frame units to greatest extent possible.

C. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish.

1. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.

D. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.

E. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.

F. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.

G. Fasteners: Conceal fasteners wherever possible.

H. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops. At other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.

1. Provide EPDM or silicone weatherstripping in bottom door rail, adjustable for contact with threshold.
2. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

2.6 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Class I Color Anodized Finish: AA-M12C22A42/A44 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, film thicker than 0.7 mil (0.018 mm) with integral color or electrolytically deposited color) complying with AAMA 606.1 or AAMA 608.1.

1. Color: Medium bronze.
2. Color: As selected by Architect from within standard industry colors and color density range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum entrances and storefronts. Correct unsatisfactory conditions before proceeding with the installation.

1. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation.

B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.

C. Construction Tolerances: Install aluminum entrance and storefront to comply with the following tolerances:

1. Variation from Plane: Do not exceed 1/8 inch in 12 feet (3 mm in 8.7 m) of length or 1/4 inch (6 mm) in any total length.
2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch (1.5 mm).
3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch (3 mm).
4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch (0.8 mm).

D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
2. Paint dissimilar metals where drainage from them passes over aluminum.
3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.

E. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

F. Refer to "Glass and Glazing" Section of Division 8 for installation of glass and other panels indicated to be glazed into doors and framing, and not preglazed by manufacturer.

3.3 ADJUSTING

A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.

3.4 CLEANING

A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.

B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.5 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION 08410

SECTION 08710 - DOOR HARDWARE

1.1 GENERAL

A. Submit final hardware schedule organized by "hardware sets," to indicate specifically the product to be furnished for each item required on each door.

1. Furnish templates to each fabricator of doors and frames as required for hardware preparation.

B. For fire-rated openings provide hardware tested and listed by UL or FM (NFPA Standard 80). On panic exit devices provide UL or FM label indicating "Fire Exit Hardware."

1.2 PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by manufacturers for various products listed below. An asterisk (*) following manufacturer's name designates manufacturer whose products are indicated in Hardware Schedule. Such products are listed in the schedule by specific reference to manufacturer's catalog numbers. Except as otherwise indicated, products of equivalent quality, design, and function by other listed manufacturers may be used, subject to approval of Architect.

1. Butts and Hinges: Bommer, Cal Royal, Hager, McKinney, H. Soss, Stanley*.
2. Pivots: Glynn-Johnson, Hager, LCN, Norton, Rixon-Firemark*, Stanley.
3. Key Control System: Key Control Systems, Telkee.
4. Cylinders and Locks: Arrow, Best, Corbin & Russwin, Falcon, Sargent, Schlage*, Yale.
5. Bolts: Builders Brass, Glynn-Johnson, Hager, Ives*, Quality, Stanley.
6. Exit/Panic Devices: Adams Rite, Arrow, Corbin & Russwin, Dor-O-Matic, Monarch, Precision, Reed, Sargent, Von Duprin*, Yale.
7. Push/Pull Units: Baldwin*, Brookline, Corbin & Russwin, Hager, Hiawatha, Ives, Triangle Brass.
8. Overhead Closers: Arrow, Corbin & Russwin, Dorma, LCN*, International Door Closers, Monarch, Norton, Rixon-Firemark, Sargent, Yale.
9. Smoke-Activated Closers: Corbin & Russwin, Dor-O-Matic, Dorma, Norton, Rixon-Firemark, Yale.
10. Floor Closers: Dor-O-Matic, Dorma, Rixon-Firemark*.
11. Door Control Devices: Baldwin, Brookline, Builders Brass, Corbin & Russwin, Glynn-Johnson*, Hager, Ives, Quality, Triangle Brass.
12. Door Trim Units: Baldwin*, Brookline, Builders Brass, Hager, Ives, Triangle Brass.
13. Kick, Mop, and Armor Plates: Baldwin*, Brookline, Corbin & Russwin, Hager, Hiawatha, Ives Triangle Brass.
14. Sliding, Sliding Pocket, and Bifold Door Hardware: Grant, Henderson, L. E. Johnson, Stanley.
15. Door Stripping and Seals: Hager, National Guard, Pemko, Reese*, Sealeze, Ultra, Zero.
16. Thresholds: Hager, National Guard, Pemko, Reese*, Sealeze, Zero.
17. Automatic Drop Seals and Astragals: Hager, National Guard, Pemko, Reese*, Zero.
18. Sound Stripping: National Guard, Pemko, Reese*, Zero.

C. Finish and base material designations are indicated in accordance with ANSI BHMA A156.18 or the nearest traditional U.S. commercial finish.

1. Where base material and quality of finish are not otherwise indicated, provide at least the commercially recognized quality specified in ANSI/BHMA A156 series standards applicable to each particular type of hardware.

D. Hinges and Pivots: Provide full-mortise butt, size, weight, and quantity in accordance with requirements established for door size, weight, and frequency of use.

1. Pins: Stainless steel, except steel pins with steel hinges; nonremovable for exterior and public interior exposure; nonrising for nonsecurity exposure; flat button with matching plugs.
2. Ball-Bearing: Swaged, inner leaf beveled, square corners.
3. Plain-Bearing: Swaged, inner leaf beveled, rounded corners; except provide ball-bearing for doors equipped with closers.

E. Locks: Equip locks with 6-pin tumbler cylinders.

1. Bored: Extra heavy duty cylindrical with removable cores.
2. Mortise: Heavy duty locksets with latch bolt, lever handles, and UL listed and labeled.

F. Weatherstripping: Provide type, size, and profile indicated, continuous at head and jamb edges of each exterior door opening. Provide noncorrosive fasteners.

1. Sponge Neoprene conforming to MIL R 6130, Class II (closed cell).

1.3 EXECUTION

A. Hardware Mounting Locations: As recommended by the Door and Hardware Institute, unless indicated otherwise.

B. Install each hardware item to comply with manufacturer's instructions and recommendations.

C. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant. Remove excess sealant and clean adjacent surfaces.

D. Hardware Adjustment: Return to Project one month after Owner's occupancy, and adjust hardware to proper operation and function. Instruct Owner's personnel in proper maintenance and adjustment.

E. Hardware Schedule: Provide hardware for each door as indicated on the list of hardware sets shown on the drawings:

END OF SECTION 08710

SECTION 08800 - GLAZING

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 glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Storefront units.
2. Vision lites.

1.3 DEFINITIONS

A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

B. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's directions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

C. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.

D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:

1. Minimum glass thickness, nominally, of lites in exterior walls is 6 mm.
2. Tinted and heat-absorbing glass thicknesses for each tint indicated are the same throughout Project.
3. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:

    a. 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action. Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.

C. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 120 F deg (67 C deg), ambient; 180 F deg (100 C deg), material surfaces.

1.5 SUBMITTALS

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

B. Product data for each glass product and glazing material indicated.

C. Samples for verification purposes of 12-inch (300 mm) square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch (300 mm) long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative in color of the adjoining framing system.

D. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.

E. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.

F. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.

G. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.

H. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

1.6 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. FGMA Publications: "FGMA Glazing Manual."

B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

C. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:

1. Insulating Glass Certification Council (IGCC).

D. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

F. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:

1. Primary glass of each (ASTM C 1036) type and class indicated.
2. Heat-treated glass of each (ASTM C 1048) condition indicated.
3. Laminated glass of each (ASTM C 1172) kind indicated.
4. Insulating glass of each construction indicated.

H. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1. Where insulating glass units will be exposed to substantial altitude changes, comply with insulating glass fabricator's recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the products specified in Product Data Sheets at end of this Section.

2.2 PRIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select).

1. Class 2 (tinted, heat-absorbing, and light-reducing) where indicated.

B. Refer to Primary Tinted Float Glass Product Data Sheet for tint color and nominal performance characteristics of Class 2 uncoated tinted glass for monolithic glazing relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

D. Refer to coated glass product requirements for tint color and performance characteristics of coated tinted glass for monolithic glazing relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

E. Refer to requirements for sealed insulating glass units for performance characteristics of assembled units composed of tinted glass, coated or uncoated, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

2.3 HEAT-TREATED FLOAT GLASS PRODUCTS, GENERAL

A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

2.4 HEAT-TREATED FLOAT GLASS

A. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), kind as indicated below.

1. Kind HS (heat strengthened) where indicated.

B. Coated, Tinted, Heat-Treated Float Glass: ASTM C 1048, Condition C (other coated glass), Type I (transparent glass, flat), Class 2 (tinted heat-absorbing and light-reducing), Quality q3 (glazing select), with kind, coating type, and performance characteristics complying with requirements specified under coated glass products.

E. Available Manufacturers: Subject to compliance with requirements, manufacturers offering heat-treated glass products that may be incorporated in the Work include, but are not limited to, the following companies.

1. AFG Industries, Inc.
2. Artistic Glass Products Co.
3. Cardinal IG.
4. Saint-Gobain.
5. Falconer Glass Industries.

6. Glasstemp, Inc.
7. Guardian Industries Corp.
8. HGP Industries.
9. PPG Industries, Inc.
10. Spectrum Glass Products, Inc.
11. Tempglass.
12. Viracon, Inc.

2.5 INSULATING GLASS PRODUCTS

A. Sealed Insulating Glass Units: Preassembled units consisting of organically sealed lites of glass separated by dehydrated air spaces complying with ASTM E 774 and with other requirements indicated, including those in Insulating Glass Product Data Sheet at the end of this Section.

1. For properties of individual glass lites making up units, refer to requirements specified elsewhere in this Section applicable to types, classes, kinds, and conditions of glass products comprising lites of insulating glass units.
2. Provide heat-treated, coated float glass of kind indicated or, if not otherwise indicated, Kind HS (heat strengthened) where recommended by manufacturer to comply with system performance requirements specified and Kind FT (fully tempered) where safety glass is designated or required.
3. Performance characteristics designated for coated insulating glass are nominal values based on manufacturer's published test data for units with lites 6 mm thick and nominal 1/2-inch (13 mm) dehydrated space between lites, unless otherwise indicated.
4. U-values are expressed as Btu/hr x sq. ft. x deg F (W/sq. m x K).

2.16 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 recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, 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. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:

1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (1250 mm) (length plus height) as follows:

1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
2. Provide 1/8-inch (3 mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.8 PROTECTION AND CLEANING

A. Protect exterior glass from breakage 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 including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

PRODUCT DATA SHEET 1 - PRIMARY TINTED FLOAT GLASS

A. Class: [Class 2 (tinted heat-absorbing and light-reducing) float glass of tint color indicated below:]

1. Solar Bronze.

C. Nominal Performance Characteristics are as indicated below:

1. Visible Light Transmittance: 38%
2. Shading Coefficient: 29%
3. Outdoor Visible Reflectance: 6%

D. Product(s): Oldcastle's Solarbronze Insulated glass

Approved Glass Fabricator Oldcastle Glass®

Glass Description FLOAT GLASS

1. **USA** - Annealed float glass shall comply with ASTM C1036, Type I, Class 1 (clear), Class 2 (tinted), Quality-Q3. **Canada** - Annealed float glass shall comply with CAN/CGSB-12.3-M, Quality-Glazing.

2. **USA**- Heat-strengthened float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind HS. **Canada** - Heat-strengthened float glass shall comply with CAN/CGSB-1 2.9-M, Type 2-Heat-Strengthened Glass, Class A-Float Glass.

3. **USA** - Tempered float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind FT. **Canada** - Tempered float glass shall comply with CAN/CGSB-12.1-M, Type 2-Tempered Glass, Class B-Float Glass.

4. **USA** - Laminated glass to comply with ASTM C1172. **Canada** - Laminated glass to comply with CAN/CGSB-1 2. 1-M, Type 1-Laminated Glass, Class B-Float Glass.

5. Glass shall be annealed, heat-strengthened or tempered as required by codes, or as required to meet thermal stress and wind loads.

Sealed Insulating Glass (IG) Vision Glass (vertical) GENERAL

1. IG units consist of glass lites separated by a dehydrated airspace that is hermetically dual sealed with a primary seal of polyisobutylene (PIB), or thermo plastic spacer (TPS) and a secondary seal of silicone or an organic sealant depending on the application.

2. **USA** - Insulating glass units are certified through the Insulating Glass Certification Council (IGCC) to either ASTM E774 or to ASTM E2190, or both. **Canada** - The Insulating Glass Manufacturers Alliance (IGMA) sponsors two certification programs in Canada. Insulating glass units are certified through the Insulating Glass Manufacturers Association of Canada (IGMAC) to CAN/CGSB-12.8, or through the Insulating Glass Manufacturers Alliance (IGMA) to ASTM E2190.

IG VISION UNIT PERFORMANCE CHARACTERISTICS

1. **Exterior Lite**
1/4" PPG Solarban® 60 on Bronze™ Low-E #2

2. **Interior Lite**
1/4" PPG Solarban® 60 on Clear Low-E #3

3. **1/2" Cavity**
Air (Standard)

4. **Performance Characteristics**

Thermal		Optical	
Winter U-factor/U-value:	0.28	Visible Light Transmittance:	38%
Summer U-factor/U-value:	0.26	Visible Light Reflectance (outside):	6%
Solar Heat Gain Coefficient:	0.25	Visible Light Reflectance (inside):	8%
Shading Coefficient:	0.29	Total Solar Transmittance:	16%
Relative Heat Gain:	62	Total Solar Reflectance (outside):	16%
Light to Solar Gain:	1.52	Ultraviolet Transmittance:	4%

1. This performance data applies to insulating glass with two plies (clear inboard) of 1/4" (6 mm) glass and a 1/2" (13 mm) air space.
2. The exterior glass ply must be heat treated.
3. The high-performance reflective coating is applied to the second surface and the Low-E coating is applied to the third surface.
4. Contact Oldcastle's Technical Services Department to determine the possibility of using annealed glass (inboard).

END OF SECTION 08800

SECTION 09220 - PORTLAND CEMENT PLASTER (STUCCO)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Interior portland cement plaster.
   2. Exterior portland cement plaster (stucco).

B. Gypsum veneer plaster and base are specified in Division 9 Section "Veneer Plaster."

C. Finish coat system is specified in Division 07241

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data consisting of manufacturer's product specifications and installation instructions for each product, including data showing compliance with the requirements specified.

C. Samples for initial selection purposes in form of manufacturer's color charts consisting of actual units or sections of units at least 12 inches (300 mm) square showing full range of colors, textures, and patterns available for each type of finish indicated.

   1. Where finish involves normal color and texture variations, include sample sets composed of two or more units showing full range of variations expected.
   2. Include similar samples of material for joints and accessories involving color selection.

D. Samples for verification purposes in units at least 12 inches (300 mm) square of each type of finish indicated, in sets for each color, texture, and pattern specified, showing full range of variations expected in these characteristics.

E. Material Certificates: Submit producer's certificate for each kind of plaster aggregate indicated evidencing that materials comply with requirements.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain materials for portland cement plaster from a single source for each type of material required to ensure consistency in quality of performance and appearance.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver cementitious materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.

B. Store materials inside, under cover, and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.6 PROJECT CONDITIONS

A. Protect contiguous work from moisture deterioration and soiling that might result from plastering operations. Provide temporary covering and whatever other provisions may be necessary to minimize harmful spattering of plaster on other work.

B. Cold Weather Requirements: Provide heat and protection (temporary or permanent) as required to protect each coat of plaster from freezing for a period of not less than 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.

1. Exterior Plaster Work: Protect plaster against freezing when ambient temperature is less than 32 deg F (0 deg C) or when 40 deg F (4 deg C) or less and falling. Heat materials and provide temporary protection and heat as required by ACI 306.
2. Interior Plaster Work: Maintain not less than 40 deg F (4 deg C) temperature in areas to be plastered for a period of not less than 48 hours prior to application, during application, and thereafter.

C. Warm Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dryout during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

D. Ventilation Requirements: Provide natural or mechanical means of ventilation to properly dry interior spaces after portland cement plaster has cured.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT PLASTER MATERIALS

A. Base Coat Cements: Type as indicated below:

1. Portland cement, ASTM C 150, type as follows:
   a. Type I or III.
   b. Type II.

B. Finish Coat Cement: Material and color as indicated below:

1. Portland cement, ASTM C 150, type as follows:
   a. Type I.
   b. Type II.
2. Cement Color: White.
3. Cement Color: Gray.

C. Factory-Prepared Finish Coat: Manufacturer's standard packaged blend of portland cement, ASTM C 150, Type I or III; hydrated lime, Type S, ASTM C 206 or ASTM C 207; aggregate, ASTM C 897; and compatible with base coat and finish texture indicated; in color indicated below:

1. White.
2. Color as indicated, manufacturer's standard product consisting of white or gray cement combined with colorfast mineral pigments and aggregates selected for color.
   a. Provide color selected by Architect from manufacturer's standard colors.

D. Lime: Special hydrated lime for finishing purposes, ASTM C 206, Type S, or special hydrated lime for masonry purposes, ASTM C 207, Type S.

E. Sand Aggregate for Base Coats: ASTM C 897.
F. Aggregate for Finish Coats: ASTM C 897 and as indicated below:
   1. Manufactured or natural sand, in color required to match Architect's sample.
G. Fiber for Base Coat: Alkaline-resistant (AR) glass or polypropylene fibers, 1/2 inch long, free of contaminates, manufactured for use in portland cement plaster.

H. Water for Mixing and Finishing Plaster: Drinkable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

2.2 MISCELLANEOUS MATERIALS
A. Bonding Agent: ASTM C 932.

B. Acid Etch Solution: Muriatic acid (10 percent solution of commercial hydrochloric acid) mixed one part to not less than 6 nor more than 10 parts of water.

C. Dash-Coat Material: Two parts portland cement to 3 parts fine sand, mixed with water to a mushy-paste consistency.

D. Asphalt-Saturated Felt: ASTM D 226, Type I (No. 15), nonperforated.

E. Line Wire: 18-gage soft annealed steel wire.

2.4 PLASTER ACCESSORIES
A. General: Comply with material provisions of ASTM C 1063; coordinate depth of accessories with thicknesses and number of coats required.

B.. Diamond Mesh Lath: Comply with the following requirements:
   1. Configuration: Self-furring.
      1) Weight: 3.4 lb/sq. yd (1.8 kg/sq. m).

C. Metal Corner Reinforcement: Expanded large-mesh diamond metal lath fabricated from zinc-alloy or welded wire mesh fabricated from 1.5-inch (38 mm) diameter zinc-coated (galvanized) wire and specially formed to reinforce external corners of portland cement plaster on exterior exposures while allowing full plaster encasement. (TYPICAL ALL EXTERIOR OUTSIDE CORNERS)

D. Metal Corner Beads: Small nose corner beads fabricated from zinc alloy, with expanded flanges of expanded large-mesh diamond lath to allow full encasement by plaster.

E. Casing Beads: Square-edged style, with expanded flanges and removable protective tape, of the following material:
   1. Material: Zinc alloy.

F. Control Joints: Prefabricated, of material and type indicated below:
   1. Material: Zinc alloy.
   2. One-Piece Type: Folded pair of nonperforated screeds in M-shaped configuration, with expanded flanges.
   3. Two-Piece Type: Pair of casing beads with back flanges formed to provide slip-joint action, adjustable for joint widths from 1/8 inch to 5/8 inch (3 mm to 16 mm).

G. Foundation Sill (Weep) Screed: Manufacturer's standard profile designed for use at sill plate line to form plaster stop and prevent plaster from contacting damp earth, fabricated from zinc-

coated (galvanized) steel complying with ASTM A 525 (A 525M) for coating designation G60 (Z180) in size indicated.

2.5 PORTLAND CEMENT PLASTER MIXES AND COMPOSITIONS

A. General: Comply with ASTM C 926 for base and finish coat mixes as applicable to plaster bases, materials, and other requirements indicated.

B. Base Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.

1. Fiber Content: Add fiber to following mixes after ingredients have mixed at least 2 minutes. Comply with fiber manufacturer's directions but do not to exceed 2 lbs. per cu. ft. (32 kg/cu m) of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.
2. Three-Coat Work Over Metal Lath: Base coats as indicated below:
   a. Scratch Coat: 1 part portland cement, 0 to 3/4 parts lime, 2-1/2 to 4 parts aggregate.
   b. Brown Coat: 1 part portland cement, 0 to 3/4 parts lime, 3 to 5 parts aggregate.

C. Job-Mixed Finish Coats: Proportion materials for finish coats in parts by volume for cementitious materials and parts by volume per sum of cementitious materials to comply with the following requirements:

1. 1 part portland cement, 3/4 to 1-1/2 parts lime, 3 parts sand.

D. Factory-Prepared Finish Coats: Add water only; comply with finish coat manufacturer's directions.

2.6 MIXING

A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 - EXECUTION

3.1 PREPARATIONS FOR PLASTERING

A. Clean plaster bases and substrates for direct application of portland cement plaster, removing loose material and substances that might impair the work.

B. Install temporary grounds and screeds as necessary to ensure accurate rodding of plaster to true surfaces; coordinate with scratch-coat work.

1. Refer to Division 6 sections for the installation of permanent wood grounds (if any).

F. Flashing: Refer to the Division 7 sections for the installation of flashing as indicated under exterior portland cement plastering.

G. Surface Conditioning: Immediately before plastering, dampen the surfaces of concrete and masonry that are indicated for direct application of plaster, except where a bonding agent has been applied. Experiment with moisture application to determine degree of saturation that will result in optimum suction for plastering.

3.2 INSTALLATION OF PLASTERING ACCESSORIES

A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated, unless otherwise indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.

B. Accessories for Portland Cement Plaster: Install accessories of type indicated at following locations:
   1. External Corners: Install corner beads at external corners.
   2. Casing Beads: Install at terminations of plaster work unless otherwise indicated.
   3. Control Joints: Install control joints at locations indicated or, if not indicated, at locations complying with the following criteria and approved by Architect.
      a. Where an expansion or control joint occurs in surface of construction directly behind plaster membrane.
      b. Where, in plastered surfaces of ceilings and walls, distances between and areas within control joints exceed, respectively, the following measurements:
         1) 10 feet (3 m) in either direction and 100 sq. ft. (9 sq. m).
      c. Where portland cement plaster panel sizes or dimensions change, extend joints full width or height of plaster membrane.

3.3 PLASTER APPLICATION

A. Portland Cement Application Standard: Apply portland cement plaster materials, compositions, and mixes to comply with ASTM C 926.

B. Sequence plaster application with the installation and protection of other work so that neither will be damaged by the installation of the other.

C. Do not use materials that are frozen, caked, lumpy, dirty, or contaminated by foreign materials.

D. Do not use excessive water in the mixing and application of plaster materials.

E. Tolerances: Do not deviate more than 1/8 inch in 10'-0" (3 mm/3 m) from a true plane in finished plaster surfaces, as measured by a 10'-0" (3 m) straightedge placed at any location on surface.

F. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where interior plaster is not terminated at metal by casing beads, cut basecoat free from metal before plaster sets and groove finish coat at the junctures with metal.

G. Corners: Make internal corners and angles square; finish external corners flush with corner beads on interior work, square and true with plaster faces on exterior work.

H. Number of Coats: Apply portland cement plaster, of composition indicated, to comply with the following requirements:
   1. Use three-coat work over the following plaster bases:
      a. Metal lath.
   2. Use two-coat work over the following bases:
      a. Concrete unit masonry.
      b. Concrete, cast-in-place or precast when surface condition complies with ASTM C 26 for plaster bonded direct to solid base.

I. Finish Coats: Apply finish coats to comply with the following requirements:

   1. Float Finish: Apply finish coat to a minimum thickness of 1/8 inch (3 mm) to completely cover base coat, uniformly floated to a true even plane with a fine-textured finish matching Architect's sample.
   2. Trowel-Textured Finish: Apply finish coat with a hand-troweled textured finish to match Architect's sample.
   3. Dash Finish: Machine-apply finish coat plaster in two coats evenly and uniformly to produce texture matching Architect's sample.

J. Moist-cure plaster base and finish coats to comply with ASTM C 926, including recommendations for time between coats and curing in "Annex A2 Design Considerations."

3.4 CUTTING AND PATCHING

A. Cut, patch, repair, and point-up portland cement plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point-up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace the work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar imperfections. Repair or replace the work as necessary to comply with required visual effects.

3.5 CLEANING AND PROTECTION

A. Remove temporary covering and whatever other provisions were made to minimize spattering of plaster on other work. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered. Repair surfaces that have been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris.

B. Provide final protection and maintain conditions in a manner suitable to Installer that ensures plaster work's being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09220

SECTION 09255 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Gypsum board assemblies attached to wood framing.
2. Cementitious backer units installed with gypsum board assemblies.

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

1. Division 6 Section "Rough Carpentry" for wood framing and furring, and gypsum sheathing applied over wood framing.
2. Division 9 Section "Gypsum Sheathing" for installations over steel framing.
3. Division 9 Section "Tile" for cementitious backer units installed as substrates for ceramic tile.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

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

B. Product Data for each type of product specified.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Gypsum Board and Related Products:

a. Domtar Gypsum.
b. Georgia-Pacific Corp.
c. National Gypsum Co.; Gold Bond Building Products Division.
d. United States Gypsum Co.

C. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work where proprietary gypsum wallboard is indicated include, but are not limited to, the following:

1. Gyprock Fireguard C Gypsum Board; Domtar Gypsum.
2. Firestop Type C; Georgia-Pacific Corp.
3. Fire-Shield G; National Gypsum Co.; Gold Bond Building Products Division.
4. SHEETROCK Brand Gypsum Panels, FIRECODE C Core; United States Gypsum Co.
5. SHEETROCK Brand Gypsum Panels, ULTRACODE Core; United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.

1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).

B. Gypsum Wallboard: ASTM C 36 and as follows:

1. Type: Regular for vertical surfaces, unless otherwise indicated.
2. Edges: Tapered.
3. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.

2.3 CEMENTITIOUS BACKER UNITS

A. Provide cementitious backer units complying with ANSI A118.9, of thickness and width indicated below, and in maximum lengths available to minimize end-to-end butt joints.

1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
2. Width: 48 inches (1219 mm).

B. Available Products: Subject to compliance with requirements, cementitious backer units that may be incorporated in the Work include, but are not limited to, the following:

1. Hardiebacker 500, James Hardie Building Products.

2.6 TRIM ACCESSORIES

A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal or plastic, with metal complying with the following requirement:

   a. Steel sheet zinc coated by hot-dip process or rolled zinc.

2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

   a. 1 ½" Bull-nosed cornerbead on outside corners, unless otherwise indicated.
   b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
   c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
   d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
   e. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

B. Accessory for Curved Edges: 1 ½" Bull-nosed cornerbead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.

2.7 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

1. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

C. Joint Tape for Cementitious Backer Units: Fiber glass mesh tape with Durabond 90 sjoint compound.

D. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer.
3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by gypsum board manufacturer.
4. For topping compound, use sandable formulation.

E. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product.

   a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
   b. Topping compound formulated for fill (second) and finish (third) coats.
   c. All-purpose compound formulated for both taping and topping compounds.

2. Job-Mixed Formulation: Powder product for mixing with water at Project site.

   a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
   b. Topping compound formulated for fill (second) and finish (third) coats.
   c. All-purpose compound formulated for both taping and topping compounds.

F. Joint Compound for Cementitious Backer Units: Durabond 90.

2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

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

D. Products: Subject to compliance with requirements, provide one of the following:

1. Acoustical Sealant for Exposed and Concealed Joints:

   a. PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.
   b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
   c. SHEETROCK Acoustical Sealant; United States Gypsum Co.

2. Acoustical Sealant for Concealed Joints:

   a. BA-98; Pecora Corp.
   b. Tremco Acoustical Sealant; Tremco, Inc.

2.9 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

D. Fastening Adhesive for Wood: ASTM C 557.

E. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.

F. Steel drill screws complying with ASTM C 1002 for the following applications:

   1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.
   2. Fastening gypsum board to wood members.
   3. Fastening gypsum board to gypsum board.

G. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

H. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.

I. Gypsum Board Nails: ASTM C 514.

J. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

K. Foam Gaskets: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit metal stud size indicated.

L. Sound-Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).

   1. Mineral-Fiber Type: Fibers manufactured from glass, slag wool, or rock wool.

M. Thermal Insulation: Material indicated below, of thickness and width to fill voids formed by Z-furring members:

1. Unfaced Mineral-Fiber Blanket Insulation: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).

   a. Mineral-Fiber Type: Fibers manufactured from glass, slag wool, or rock wool.

N. Polyethylene Vapor Retarder: ASTM D 4397, thickness and maximum permeance rating as follows:

1. 6 mils (0.15 mm), 0.13 perms (7.5 ng/Pa x s x sq. m).

O. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.10 TEXTURE FINISH PRODUCTS

A. Primer: Of type recommended by texture finish manufacturer.

B. Aggregate Finish: Factory-packaged proprietary drying-type powder product formulated with aggregate for mixing with water at Project site for spray application to produce texture indicated below:

1. Spatter knockdown finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

G. Attach gypsum panels to framing provided at openings and cutouts.

H. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.

I. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

J. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

K. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

L. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.

M. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

N. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

O. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.3 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

B. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:

1. Install cementitious backer units to comply with ANSI A108.11 at kitchen, toilets, and where indicated.
2. Install cementitious backer units to comply with ANSI A108.11 at locations indicated to receive wall tile.

C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

1. Fasten with screws.
2. Fasten to wood supports with single nailing.

I. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered over supports.

1. Install with 1/4-inch (6.4-mm) open space where panels abut other construction or structural penetrations.
2. Fasten with corrosion-resistant screws.

J. For curved partitions, install gypsum panels as follows:

1. Select gypsum panel lengths and cut them as required to produce one unbroken panel covering each curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.
2. Wet gypsum panels on surfaces that will become compressed when panels are installed over a curve and where curve radius prevents using dry panels. Comply with gypsum board manufacturer's recommendations relative to curve radii, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.
3. Apply gypsum panels horizontally with wrapped edges perpendicular to studs. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around the curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches (300 mm) o.c.
4. For double-layer construction, apply gypsum board base layer horizontally and fasten to studs with screws spaced 16 inches (400 mm) o.c. Center gypsum board face layers over joints in base layer and fasten to studs with screws spaced 12 inches (300 mm) o.c.
5. Allow wetted gypsum panels to dry before applying joint treatment.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install 1 ½" bull-nosed cornerbead at external corners.

C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
3. Install U-bead where indicated.

D. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.

C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
2. Level 2 where panels form substrates for tile and where indicated.
3. Level 3 for gypsum board where indicated.

E. Use the following joint compound combination as applicable to the finish levels specified:

1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound.

F. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint compound.

G. Finish exterior gypsum soffit board using setting-type joint compounds to prefill joints and embed tape, and for first, fill (second), and finish (third) coats, with the last coat being a sandable product. Smooth each coat before joint compound hardens to minimize need for sanding. Sand between coats and after finish coat.

1. Painting exterior gypsum soffit board after finish coat has dried is specified in another Division 9 Section.

H. Finish cementitious backer units to comply with unit manufacturer's directions.

3.10 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes according to texture finish manufacturer's instructions. Apply primer only to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish to gypsum panels and other surfaces indicated to receive texture finish according to texture finish manufacturer's directions. Using powered spray equipment, produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray as recommended by texture finish manufacturer to prevent damage.

3.11 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09255

SECTION 10200 - LOUVERS AND VENTS

1.1 GENERAL

A. Structural Performance: Engineer, fabricate, and install louvers to withstand the effects of loads and stresses from wind and normal thermal movement without evidencing permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors.

1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf per sq. ft. (960 Pa), acting inwards or outwards.
2. Normal thermal movement resulting from 100 deg F (56 deg C) change (range) in ambient temperature and its effect on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

B. Air-Performance, Water-Penetration, and Air-Leakage Ratings: Provide louvers complying with performance requirements indicated as demonstrated by testing manufacturer's stock units of height and width indicated. Test units according to AMCA 500.

1. AMCA Seal: Mark units with the AMCA Certified Ratings Seal.

C. Field Measurements: Check louver openings by field measurements before fabrication.

1.2 PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Airline Products Co.
2. Airolite Co.
3. Airstream Products Div., Penn Ventilator Co., Inc.
4. All-Lite Louver Co.
5. American Warming and Ventilating, Inc.
6. Arrow United Industries.
7. Construction Specialties, Inc.
8. Greenheck Fan Corp.
9. Industrial Louvers, Inc.
10. Reliable Metal Products, Div. of Hart & Cooley, Inc.
11. Riesner Vent Brick Corp.
12. Ruskin Mfg., Tomkins Industries, Inc.
13. Sunvent Industries, Sylro Sales Corp.

B. Materials: As follows:

1. Galvanized-Steel Sheet: ASTM A 526/A 526M or ASTM A 527/A 527M, G 90 (Z 275) zinc coating, mill phosphatized.
2. Fasteners: Of same basic metal and alloy as fastened metal or 300 series stainless steel. Do not use metals that are corrosive or incompatible with joined materials.
3. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

C. Fabrication, General: Fabricate louvers and vents to comply with requirements indicated for design, dimensions, materials, joinery, and performance.

1. Fabricate frames, including sills, to fit adjoining construction, with mullions at spacing indicated but not farther apart than recommended by the manufacturer.
2. Join frame members to one another and to blades as follows:

    a. With fillet welds, concealed from view; or mechanical fasteners; or both; as standard with the manufacturer.

D. Fixed, Formed-Metal Wall Louvers: As follows with louver depth, frame type, blade profile, and blade angle as shown.

1. Horizontal, drainable, fixed-blade louvers with gutters in front edges of blades and channels in jambs and mullions for drainage, complying with the following requirements:

    a. Metal and Thickness: Galvanized steel, 0.0396 inch (1.01 mm).

E. Louver Screens: On interior face of exterior louvers, provide louver screens as follows:

1. Frames: Same kind and form of metal as indicated for louver frames to which screens are attached, and as follows:

    a. Type: Rewireable with a driven spline or insert for securing screen mesh.

3. Louver Screening for Galvanized-Steel Louvers: As follows:

    a. Bird Screening: 1/2-inch- (12.7-mm-) square mesh, 0.041-inch- (1.04-mm-) diameter galvanized-steel wire.

F. Finishes, General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes. Finish louvers after assembly.

I. Baked-Enamel Finish: AA-C12C42R1x. Apply baked enamel complying with paint manufacturer's specifications for cleaning, conversion coating, and painting.

    a. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 603.8 except with minimum dry film thickness of 1.5 mils (0.038 mm), medium gloss.

        1) Color: As indicated by manufacturer's color designations.
        2) Color: Match Architect's sample.
        3) Color: As selected by Architect from manufacturer's full range of colors.
        1) Color and Gloss: As indicated by manufacturer's color and gloss designations.
        2) Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.

G. Galvanized-Steel Sheet Finishes: As follows:

1. Surface Preparation: Clean surfaces of dirt, grease, and other contaminants followed by a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas followed by an application of galvanizing repair paint to comply with ASTM A 780.
2. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply an air-dried primer immediately following cleaning and pretreating.
3. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-enamel finish consisting of prime coat and thermosetting

topcoat, with not less than a 1.0-mil (0.025-mm) dry film thickness for topcoat. Comply with paint manufacturer's instructions for applying and baking to achieve a minimum dry film thickness of 2.0 mils (0.051 mm).

a. Color and Gloss: As indicated by manufacturer's color and gloss designations.

1.3 EXECUTION

A. Locate and place louver units plumb, level, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Repair finishes damaged by cutting, welding, soldering, and grinding operations required for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items that cannot be refinished in the field to the shop, make required alterations, and refinish entire unit, or provide new units.

F. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

END OF SECTION 10200

SECTION 10522 - FIRE EXTINGUISHERS AND ACCESSORIES

1.1 GENERAL

A. UL-Listed Products: Fire extinguishers shall be UL listed with UL Listing Mark for type, rating, and classification of extinguisher.

D. FM-Listed Products: Fire extinguishers approved by Factory Mutual Research Corporation for type, rating, and classification of extinguisher with FM marking.

1.2 PRODUCTS

A. Fire Extinguishers: Provide fire extinguishers for each suite minimum (4) required and for other locations indicated.

1. Multipurpose Dry Chemical Type: UL-rated 1-A:10-B:C, 2-1/2-lb nominal capacity, in enameled steel container.

B. Mounting Brackets: Provide brackets of sizes required for type and capacity of extinguisher indicated, in plated finish.

1.3 EXECUTION

A. Installation: Follow manufacturer's printed instructions.

B. Install at heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

1. Fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb.

END OF SECTION 10522

SECTION 13000 – COVERED PARKING STRUCTURES

1.1 General:

A. The following specification is for custom covered parking structures (two structures for two vehicles each) as indicated on the drawings and are based on Sunports semi-cantilevered model (http://www.sunports.com/examples/index.asp?id=1206)

Sun Ports International, Inc.
8505-A Chancellor Row
Dallas TX 75247

1(800)966-5005

B. Performance Requirements: Design, fabricate, and erect the building to withstand loads from winds, gravity, and structural movement, and resist in-service use without failure. Design members to withstand stresses resulting from combinations of loads that produce maximum allowable stresses prescribed in 2003 IBC

1. Design Loads: Basic design loads are indicated on the structural drawings.

C. Structural Framing and Roof and Siding Panels: Design structural members and exterior covering for applicable loads and combinations of loads in accordance with the MBMA's "Design Practices Manual."

1. Structural Steel: Comply with AISC's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
2. Light Gage Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.
3. Welded Connections: Comply with AWS's "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.

D. Submittals: Submit the following in accordance with Conditions of the Contract and Division 1.

1. Product Data: Include manufacturer's product information for building components and accessories.
2. Shop Drawings: Provide shop drawings for structural framing system, roofing and siding fabric, and components and accessories not fully detailed or dimensioned in manufacturer's product data.

E. Installer Qualifications: Engage an experienced Installer who specializes in erection of buildings similar to that required and is certified by the building manufacturer as qualified for erection of the manufacturer's products.

1.2 Products:

STEEL SPECIFICATIONS

The Steel Structure is designed to meet or exceed the requirements of the 2002 IBC Building Code. The Steel Structure is covered by a 10-year warranty against failure of the structure, a one-year paint warranty, and fabric is covered by a full 10-year warranty against significant fading, tearing, ripping and/or discoloration (red is covered by a 3-year fade warranty.)

Standard Structures

Live Load	10.00 psf
Wind Design Speed	90 mph
Snow Load	10.00 psf

Foundations
The foundations are designed depending on specific soil conditions.

Concrete
Concrete work is executed in strict accordance with the latest American Concrete Institute Building Code (ACI 318-99.)

Concrete Specifications
28-Day Strength: 3000 psi

Concrete Anchors
A) Cast in-place footings
Cast in-place anchors are A-36 steel.

Steel
All Reinforcement conforms to 60,000 psi ASTM A-42 Grade 60(excludes Super Spans and Tension Cable Structures). Reinforcement steel, if required, is designed, detailed, fabricated and placed in accordance with the latest ACI Detailing Manual (SP-66) and CRSI Manual of Standard Practice

Structural Steel
All steel tubing is triple coated for rust protection using the in-line zinc electroplating, Allied Flo-Coat® process. Tubing is internally coated with zinc and organic coatings to prevent corrosion.

All structural steel plates are rust/corrosion treated by zinc electroplating. Steel tubing and plates are finished with a minimum of 2.5 to 3.5 MIL thick UV-inhibited weather resistant powder coat.

Where size of structure or determined loads require larger structural steel members or steel greater than 7 gauge thickness, carbon steel may be substituted. Cleaning and coating of carbon steel conforms to the following:

1. A de-greasing agent is applied to remove surface oil and grease.
2. An acid-phosphate wash be applied to etch and prepare the surface for powder-coating, where wall thickness requires pre-heating.
3. Steel members are to be pre-heated prior to powder coat application to assure adhesion.

1. All carbon Structural Steel shall be ASTM A-36, except steel pipe columns, which shall be ASTM A-53, grade B, unless otherwise noted. Slip fittings are manufactured using drawn-over-mandrel steel with a minimum yield strength of 70 ksi and a minimum tensile strength of 80 ksi.

2. Steel telescoped sleeves do not have more than 1/16" tolerance, with no less than 4" overlap at all sleeves. All internal fittings are welded on one side.

3. Structural steel is detail, fabricated, and erected in accordance with AISC specifications.

4. All shop and field welding is executed by certified welders in accordance with the latest edition of the American Welding Society specifications.

5. Shop connections are welded unless noted otherwise. Field connections are separately indicated on all drawings.

6. All welds are performed using E70 electrodes or gas-metal arc welding using ER 7053 wire. All fillet welds are a minimum 3/16" unless otherwise noted. All steel shall be welded shut at terminations to prevent internal leakage.

Hardware
All hardware is first grade stainless steel. All bolt fittings include nylon washers for watertight seals at all joints.

Wire rope is ¼" nominal diameter, 7 strand, 19 wires per strand (minimum), with a minimum nominal tensile strength of 9,000 pounds. Wire rope shall be secured with approved fittings and cable hardware, as per manufacturers' specifications.

All erection bolts are ASTM A-307 grade B, treated to retard corrosion, or stainless steel.

Steel Colors
Custom steel paint color shall match ICI 521, Deacons Bench.

CLOTH SPECIFICATIONS

Thread-PTFE (TEFLON®) Specifications
All thread used meets the following specifications -

- High Strength
- Low Shrinkage
- Wide Temperature Range
- Flex & Abrasion Resistant and UV Radiation Immunity
- Thread is guaranteed to meet or exceed the fabrics liftime
- It is unaffected by cleaning agents, acid rain, mildew, rot, chlorine, saltwater, and industrial pollutants.
- Lockstitch Thread - 1200 Denier
- Chainstitch Thread - 2400 Denier

Sewing Specifications

- All corners to be strengthened with 16oz. Non-Tear Vinyl material
- Protective webbing is sewn into all areas where steel cable enters/ exits cloth pockets.

Fabric Specifications

Raw Material	High Density Polyethylene with Ultra Violet additives.	
Construction	A monofilament and tape construction giving a stable material. Rachel knitted to ensure material will not unravel if cut.	
	SOLID COLORS	**STRIPE COLORS**
Finish	Fabric is stentored.	Fabric is stentored.
Tear Strength	Warp 220.4622 lb. Weft 462.9707 lb.	Warp 182.9836 lb. Weft 401.2413 lb.
Burst Strength	37.7098 PSIA	33.0686 PSIA

Fabric Mass	6.8784 ozm	7.0547 ozm
Fabric Width	9.8425 ft.	9.8425 ft.
Roll Length	164.04 ft.	164.04 ft.
Roll Dimensions	62.99" X 16.5354"	62.99" X 16.5354"
Roll Weight	+/- 66 lb.	+/- 68.34 lb.
Life Expectancy	A minimum of 8 years continuous exposure to the sun	
Fading	Minimum fading after 5 years.	
Minimum Temperature	- 22° F	- 22° F
Maximum Temperature	+ 176° F	+ 176° F

Fabric Colors
Standard color Arizona (Beige).

L. Cleaning and Touch-Up: Clean component surfaces. Touch up abrasions, marks, skips, or other defects to shop-primed surfaces with same material as shop primer.

END OF SECTION 13000