SECTION 00 0110
TABLE OF CONTENTS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

DIVISION 08 - OPENINGS

DIVISION 09 - FINISHES

DIVISION 10 - SPECIALTIES

DIVISION 22 – PLUMBING-SEE PLUMBING DRAWINGS

DIVISION 23 - HEATING, VENTILATING AND AIR-CONDITIONI (HVAC)- SEE MECHANICAL DRAWINGS

DIVISION 26 – ELECTRICAL-SEE ELECTRICAL DRAWINGS

END OF SECTION

SECTION 01 3310
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED SECTIONS

A. Division 01 for submitting test and inspection reports and Delegated-Design Submittals and erecting mock-ups.

B. Division 01 for submitting warranties, project Record Documents and operation and maintenance manuals.

1.03 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.04 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Gardner Spencer Smith Tench and Jarbeau, PC for contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that requires sequential activity.
   2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Gardner Spencer Smith Tench and Jarbeau, PC reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittal Schedule: Comply with requirements in Division 1 for list of submittals and time requirements for schedule performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Gardner Spencer Smith Tench and Jarbeau, PC's receipt of submittal.
   1. Initial Review: Allow 10 business days for initial review of each submittal. Allow additional time of processing must be delayed to permit coordination with subsequent submittals. Gardner Spencer Smith Tench and Jarbeau, PC will advise Contractor when a submittal being processed must be delayed for coordination.
   2. Concurrent Review: Where concurrent review of submittals by Gardner Spencer Smith Tench and Jarbeau, PC's consultants, Owner, or other parties is required, allow 15 business days for initial review of each submittal.
   3. If intermediate submittal is necessary, process it in same manner as initial submittal.
   4. Allow 10 business days for processing each resubmittal.
   5. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

E. Identification: Place a permanent label or title block on each submittal for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Gardner Spencer Smith Tench and Jarbeau, PC.
3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of subcontractor.
   d. Name and address of supplier.
   e. Name of manufacturer.
   f. Unique identifier, including revision number.
   g. Number and title of appropriate Specification Section.
   h. Drawing number and detail references, as appropriate.
   i. Other necessary identification.

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

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Gardner Spencer Smith Tench and Jarbeau, PC will discard or notify Contractor if submittals are received from sources other than the Contractor.
1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Gardner Spencer Smith Tench and Jarbeau, PC on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations of form for the following information:
   a. Project name.
   b. Date.
   c. Destination (To:).
   d. Source (From:).
   e. Names of subcontractor, manufacturer, and supplier.
   f. Category and type of submittal.
   g. Submittal and transmittal distribution record.
   h. Remarks.
   i. Signature of transmitter.

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

I. Use for Construction: Use only final submittals with mark indicating action taken by Gardner Spencer Smith Tench and Jarbeau, PC in connection with construction.

PART 2 PRODUCTS

2.01 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit three copies of each submittal, unless otherwise indicated. Gardner Spencer Smith Tench and Jarbeau, PC will return two copies. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's written recommendations.
      b. Manufacturer's product specifications.
      c. Manufacturer's installation instructions.
      d. Standard color charts.
      e. Manufacturer's catalog cuts.
      f. Wiring diagram showing factory-installed wiring..
      g. Standard product operating and maintenance manuals.
      h. Compliance with recognized trade association standards.
      i. Compliance with recognized testing agency standards.
      j. Application of testing agency labels and seals.
      k. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
   1. Preparation: Include the following information, as applicable:
      a. Dimensions.
      b. Identification of products.
      c. Fabrication and installation drawings.
      d. Roughing-in and setting diagrams.
      e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
      f. Shop work manufacturing instructions.
      g. Templates and patterns.
      h. Schedules.
      i. Design calculations.
      j. Compliance with specified standards.
      k. Notation of coordination requirements.
      l. Notation of dimensions established by field measurement.
   2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
   3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8 1/2 by 11 inches, but no longer than 30 by 40 inches.

D. Coordination Drawings: Comply with requirements in Division 01.

E. Samples: Prepare physical units of materials or products, including the following:
   1. Comply with requirements in Division 01 for mockups.
   2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   3. Sample for Verification: Submit full-size units or Samples used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Gardner Spencer Smith Tench and

Jarbeau, PC's sample where so indicated. Attach label on unexposed side that includes the following:
   a. Generic Description of Sample.
   b. Product name or name manufacturer.
   c. Sample source.
5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
   a. Size limitations.
   b. Compliance with recognized standards.
   c. Availability.
   d. Delivery time.
6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics between final submittal and actual component as delivered and installed.
   a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
   b. Refer to individual Specifications Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
7. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Gardner Spencer Smith Tench and Jarbeau, PC will return submittal with options selected.
8. Number of Samples for Verification: Submit three sets of Samples. Gardner Spencer Smith Tench and Jarbeau, PC will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
   a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

2.02 INFORMATIONAL SUBMITTALS

A. General: prepare and submit Informational Submittals required by other Specification Sections.
   1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Gardner Spencer Smith Tench and Jarbeau, PC will not return copies.
   2. Certificates and Certifications: Provide a notarized statement that includes signature of entry responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   3. Test and Inspection Reports: Comply with requirements in Division 01.

B. Contractor's Construction Schedule: Comply with requirements in Division 01.

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

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

E. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

F. Field Test Reports: Prepare reports written by qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

G. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 01..

H. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
   1. Preparation of substrates.
   2. Required substrate tolerances.
   3. Sequence of installation or erection.
   4. Required installation tolerances.
   5. Required adjustments.
   6. Recommendations for cleaning and protection.

PART 3 EXECUTION

3.01 CONTRATOR'S REVIEW

A. Review each submittal and check for compliance with Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Gardner Spencer Smith Tench and Jarbeau, PC

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

3.02 ARCHITECTS ACTIONS

A. General: Gardner Spencer Smith Tench and Jarbeau, PC will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Gardner Spencer Smith Tench and Jarbeau, PC will review each submittal, make marks to indicate corrections or modifications required, and return it. Gardner Spencer Smith Tench and Jarbeau, PC will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken,

END OF SECTION

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Senior Center.

B. Owner's Name: Union County Commissioner's Office.

C. Architect's Name: Gardner Spencer Smith Tench and Jarbeau, PC.

D. Summary:
   1. Briefly and without force and effect on the requirements of the Contract Documents, the project and the work of the Contract can be described in summary as follows:
      a. Work included:
         1) Demolition and removal of existing facings and structures, electrical and mechanical infrastructure.
         2) Construction of a new addition with the installation of new ceilings, walls, doors, windows and finishes with electrical, mechanical, in conjunction with infrastructure modifications within the existing facility.

1.02 OWNER'S REPRESENTATIVE

A. All documentation required by the Specifications to be submitted to the Union County Commissioner's Office shall be submitted to Gardner Spencer Smith Tench and Jarbeau, PC for review and transmittal to the Union County Commissioner's Office.

B. All instructions and requests for changes from the Union County Commissioner's Office to the Contractor will be issued through Gardner Spencer Smith Tench and Jarbeau, PC; Provided, that Gardner Spencer Smith Tench and Jarbeau, PC shall not have the authority to authorize any changes in the Work which would result in change to the Contract Sum or to the Contract Time, provided further, that Gardner Spencer Smith Tench and Jarbeau, PC will receive and review Contractor's proposal for such changes and will submit recommendations to the Union County Commissioner's Office for issuance of Change Orders.

C. Changes in the Contract Sum shall be authorized in writing solely by Union County Commissioner's Office.

D. Except as otherwise noted, the Contractor shall disregard any instructions from persons other than Gardner Spencer Smith Tench and Jarbeau, PC.

E. Should a situation arise in conflict with these requirements, the Contractor shall notify Gardner Spencer Smith Tench and Jarbeau, PC immediately.

F. The Contractor shall bear all costs incurred by his failure to follow instructions contained in the preceding paragraphs.

1.03 OBLIGATIONS OF CONTRACTOR

A. Except as otherwise specifically noted, provide and pay for:
   1. Labor, materials and equipment;
   2. Tools, construction equipment and machinery;
   3. Temporary heat and utilities required for construction;
   4. Other temporary facilities and services necessary for proper execution and completion of work;
   5. Temporary facilities such as partitions, lights, barricades, walkways, steps, ladders, railings, etc. necessary to assure the safety of the workers, students and staff of the school as well as the general public;
   6. "As-Built" drawings.

B. Pay legally required sales, consumer and use taxes.

C. Make all applications, secure and pay for as may be required for proper execution and completion of the work, and as required by authorities having jurisdiction:
   1. Any Permits, Business Licenses, deposits and/or fees of any kind that are a prerequisite for doing any of the work of this Contract.
   2. Interim and final inspections of the Work and/or any portions of the Work.
   3. Post all bonds (and/or security deposits) that are a prerequisite for doing any of the work of this Contract.

D. Give required notices.

E. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities having jurisdiction over this work.

F. Promptly submit written notice to Gardner Spencer Smith Tench and Jarbeau, PC of any observed variance of Contract Documents from legal requirements.

G. The Contractor shall have a supervisor on the project anytime any work is taking place or when delivery of equipment is expected.

1.04 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5200 - Agreement Form.

1.05 EXECUTIVE ORDERS

A. The Contractor, by signing the Contract, acknowledges that he is aware of and will comply with the contents and requirements of the following Acts and Executive Orders.

B. The non-discrimination clause contained in Section 202, Executive Order 11246, as amended by Executive Order 11375, relative to Equal Employment Opportunity for all persons without regard to race, color, religion, sex, or national origin. The implementing rules and regulations described by the Secretary of Labor are incorporated.

1.06 WORK/COSTS BY OWNER

A. Loose furnishings, not otherwise called for.

B. Items marked N.I.C. on the drawings.

1.07 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Union County Commissioner's Office before Substantial Completion.

1.08 OWNER OCCUPANCY

A. Union County Commissioner's Office intends to continue to occupy adjacent portions of the existing building during the entire construction period.

B. Union County Commissioner's Office intends to occupy the Project upon Substantial Completion.

C. Cooperate with Union County Commissioner's Office to minimize conflict and to facilitate Union County Commissioner's Office's operations.

D. Schedule the Work to accommodate Union County Commissioner's Office occupancy.

1.09 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Union County Commissioner's Office occupancy.
      a. Union County Commissioner's Office will endeavor to cooperate with the Contractor's operation when the Contractor has notified Union County Commissioner's Office in advance of the need for changes in operations in order to accommodate construction

operations.
b. Conduct the work so as to cause the least interference with Union County Commissioner's Office's operations.
2. Unless otherwise noted on the drawings or approved in advance the existing school and its parking is off limits to all construction personnel.
3. Work by Others.
4. Work by Union County Commissioner's Office.
5. Use of site and premises by the public.

C. Access to the site will be extremely limited; obtain Union County Commissioner's Office's approval of proposed routing of construction traffic and time of day access.

D. Provide access to and from site as required by law and by Union County Commissioner's Office:
1. Do not obstruct roadways, sidewalks, or other public ways without permit.

E. Storage and staging areas are limited but will be available on site.

F. Signs: Provide signs adequate to direct visitors and Union County Commissioner's Office's personnel.
1. Do not install, or allow to be installed, signs other than specified sign(s) and signs identifying the principal entities involved in the project, unless authorized by Union County Commissioner's Office
2. Do not install any signs in violation of local zoning ordinances.

G. Existing building spaces may not be used for storage.

H. Time Restrictions:
1. Limit conduct of especially noisy especially noisy, malodorous, and dusty exterior work to the hours of time mutually agreeable to the Contractor and Owner.

I. Utility Outages and Shutdown:
1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Union County Commissioner's Office and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

1.10 WORK SEQUENCE

A. Coordinate construction schedule and operations with Union County Commissioner's Office.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SECURITY AND SAFETY PROCEDURES

A. Coordinate construction security and safety measures with security and safety programs of the Union County Commissioner's Office.
1. Establish procedures and notification priority required for emergency action including, but not limited to, events involving fire, injury, and/or damage to property.
2. Post and maintain current list of emergency numbers required for action or requested by the Union County Commissioner's Office.

B. Do not allow any cameras or photography on site unless authorized by the Union County Commissioner's Office.

C. Maintain log of workers and visitors accessing the site, available to the Union County Commissioner's Office upon request.

D. Limit access to the site to persons involved in the work.

E. Provide secure storage for materials for which the Union County Commissioner's Office has made payment and which are stored on site.

F. Secure completed work as required to prevent loss.

3.02 PROTECTION OF PUBLIC FROM INJURY

A. Due to the proximity of the work to the public and to the large number of school personnel in the vicinity of the construction area, the Contractor is cautioned to exercise special care in protecting the public from injury during all phases of the work. Contractor is directed to provide adequate protective barriers to restrain public access to all hazardous areas. Before commencing the Work, a safety plan shall be developed by Contractor. Contractor shall make provisions for enforcing protection of property and public including locations of barricades, construction signs, and exit signs.

B. As the development and implementation of the safety plan is the sole responsibility of Contractor, it shall not be reviewed by the Gardner Spencer Smith Tench and Jarbeau, PC.

3.03 SPECIAL REQUIREMENTS

A. There will be no tobacco use allowed in the school or on school property.

B. Attire: Proper attire shall be worn at all times.
   1. Shirts shall be worn while on school property at all times. No tank tops or undershirts will be permitted.
   2. Clothing displaying nudity, obscene language, obscene symbols or pro-drug slogans is prohibited.
   3. Shorts will not be permitted.
   4. Fraternization: Workers shall not fraternize with school staff or students.
   5. Any failure to follow these requirements will result in removal from the school grounds, without recourse.

3.04 COORDINATION

A. If necessary, inform each party involved, in writing, of procedures required for coordination; include requirements for giving notice, submitting reports, and attending meetings.
   1. Inform the Union County Commissioner's Office when coordination of his work or activities is required.

B. When the following must be modified or in any way interrupted, provide alternate facilities acceptable to Union County Commissioner's Office:
   1. Emergency means of egress.
   2. Utilities which must remain in operation.

C. See other requirements in other portions of the contract documents.

D. Prepare coordination drawings where limited space available may cause conflicts in the locations of installed products, and where required to coordinate installation of products.
   1. Where space is limited, show plan and cross-section dimension of space available, including structural obstructions and ceilings as applicable.
   2. Coordinate shop drawings prepared by separate entities.
   3. Show installation sequence when necessary for proper installation.

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

B. References and standards.

C. Submittals.

D. References and standards.

E. Control of installation.

F. Control of installation.

1.02 RELATED REQUIREMENTS

A. Divisions 02 through 48 Sections for specific test and inspection requirements.

B. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.

C. Section 01 2100 - Allowances: Allowance for payment of testing services.

D. Section 01 3000 - Administrative Requirements: Submittal procedures.

E. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants 2008 (Reapproved 2014).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2019.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2020.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2015.

1.04 DEFINITIONS

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

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

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

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

1.05 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

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

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

D. Testing Agency Qualifications:
   1. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
   2. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

E. Design Data: Submit for Gardner Spencer Smith Tench and Jarbeau, PC's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Union County Commissioner's Office's information.

F. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
   1. Specification Section number and title.
   2. Description of test and inspection.
   3. Identification of applicable standards.
   4. Identification of test and inspection methods.
   5. Number of tests and inspections required.
   6. Time schedule or time span for tests and inspections.
   7. Entity responsible for performing tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

G. Test Reports: After each test/inspection, promptly submit two copies of report to Gardner Spencer Smith Tench and Jarbeau, PC and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.

j. Conformance with Contract Documents.
k. When requested by Gardner Spencer Smith Tench and Jarbeau, PC, provide interpretation of results.

H. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Gardner Spencer Smith Tench and Jarbeau, PC, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Gardner Spencer Smith Tench and Jarbeau, PC.

I. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Union County Commissioner's Office's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

J. Manufacturer's Field Reports: Submit reports for Gardner Spencer Smith Tench and Jarbeau, PC's benefit as contract administrator or for Union County Commissioner's Office.
1. Submit report in duplicate within 30 days of observation to Gardner Spencer Smith Tench and Jarbeau, PC for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

K. Erection Drawings: Submit drawings for Gardner Spencer Smith Tench and Jarbeau, PC's benefit as contract administrator or for Union County Commissioner's Office.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Gardner Spencer Smith Tench and Jarbeau, PC or Union County Commissioner's Office.

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

1.07 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Gardner Spencer Smith Tench and Jarbeau, PC before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Gardner Spencer Smith Tench and Jarbeau, PC shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.08 QUALITY ASSURANCE

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

production capacity to produce required units.

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

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

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

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

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

G. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
   1. Contractor responsibilities include the following:
      a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
      d. When testing is complete, remove assemblies; do not reuse materials on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Gardner Spencer Smith Tench and Jarbeau, PC ten business days in advance of dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Gardner Spencer Smith Tench and Jarbeau, PC's approval of mockups before starting work, fabrication, or construction.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
   6. Demolish and remove mockups when directed, unless otherwise indicated.

1.09 QUALITY CONTROL

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

1. Union County Commissioner's Office will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
2. Costs for re-testing and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
1. Where services are indicated as Contractor’s responsibility, engage a qualified testing agency to perform these quality-control services.
    a. Contractor shall not employ the same entity engaged by Union County Commissioner's Office, unless agreed to in writing by Union County Commissioner's Office.
2. Notify testing agencies at lest 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor’s responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract documents are Contractor’s responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Union County Commissioner's Office will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Union County Commissioner's Office.
1. Testing agency will notify Gardner Spencer Smith Tench and Jarbeau, PC and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Gardner Spencer Smith Tench and Jarbeau, PC with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

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

E. Re-testing/Re-inspecting: regardless of whether original tests or inspections were Contractor’s responsibility, provide quality-control services, including re-testing and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Gardner Spencer Smith Tench and Jarbeau, PC and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Gardner Spencer Smith Tench and Jarbeau, PC and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

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

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incident labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.
1. Distribution: Distribute schedule to Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Gardner Spencer Smith Tench and Jarbeau, PC before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 REPAIR AND PROTECTION

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

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

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

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

END OF SECTION

SECTION 01 4110
TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SUMMARY

A. General: See individual specification sections for requirements of testing.

B. Applicable standards, latest edition, if not otherwise indicated in the individual sections where testing is required.
   1. American Concrete Institute (ACI).
   2. American Institute of Steel Construction. (AISC).
   3. American National Standards Institute (ANSI).
   4. American Society for Testing and Materials (ASTM).
   5. American Welding Society (AWS).

1.02 TESTING AGENCY

A. Except as otherwise specified, testing will be performed by an independent testing agency or agencies selected by Union County Commissioner's Office and paid by the Contractor using the Testing Laboratory Services Allowance established in Section 01 2100 - Allowances.

B. Contractor shall pay costs for testing beyond the scope of that required by the Contract Documents and for re-testing if initial tests reveal non-conformance with specified requirements.

C. Tests and Inspections shall be conducted in accordance with specified requirements, and if not specified, in accordance with the applicable standards of the American Society for Testing and Materials (ASTM) or other recognized and accepted authorities in the field.

D. Work Included:
   1. Earthwork.
   2. Cast-in-place Concrete.
   3. Structural Steel.
   4. Asphaltic concrete.

1.03 QUALIFICATION OF LABORATORY

A. The Testing Laboratory selected should meet the basic requirements of ASTM E329 "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction", shall be inspected and approved by the ELF, FC & PA Joint Technical Committee, Inc. or by an equivalent recognized national authority and shall submit to the Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC, and the Engineer, a copy of the report of inspection of their facilities.

B. The Testing Laboratory selected shall meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, as published by the "American Council of Independent Laboratory Qualification".

C. Testing machines shall be calibrated at intervals not exceeding 12 months by devices of accuracy traceable to the National Bureau of Standards or accepted values of natural physical constants. The testing laboratory shall submit a copy of certificate of calibration made by an accredited calibration agency.

D. The Testing Laboratory is only required to have testing facilities for work included in this project.

E. The agent of the Testing Laboratory performing field sampling and field testing of concrete shall be certified by the American Concrete Institute as a Concrete Field Testing Technician - Grade 1, or by an equivalent recognized national authority for an equivalent level of competence, or shall be a Licensed Professional, Engineer.

1.04 AUTHORITIES AND DUTIES OF THE LABORATORY

A. The Testing Laboratory shall obtain and review the project plans and specifications with Gardner Spencer Smith Tench and Jarbeau, PC and Engineer six (6) weeks prior to the start of construction. The Laboratory shall attend pre-construction conferences with Gardner Spencer Smith Tench and Jarbeau, PC, Engineer, Contractor's Project Manager, Contractor's Superintendent, and Material Suppliers, to coordinate materials inspection and testing requirements with the planned construction schedule. The Laboratory will participate in such conferences throughout the course of the project.

B. The Testing Laboratory shall be responsible for outlining a written detailed testing program conforming to the requirements as specified in the Contract Documents and in consultation with the Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC, and Engineer. The testing program shall contain an outline of inspections and tests to be performed with reference to applicable sections of the specifications or drawings and a list of personnel assigned to each portion of the work. Such testing program shall be submitted to the Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC, and Engineer five (5) weeks in advance of the start of construction so as not to delay the start of construction. It shall be the Testing Laboratory's responsibility that such program conforms to the requirements of the Specifications and falls within the Union County Commissioner's Office's budget for testing laboratory services. If the allocated budget is not sufficient to cover the services as outlined in the Specifications, it shall be the responsibility of the Laboratory to notify the Gardner Spencer Smith Tench and Jarbeau, PC, Engineer, and Union County Commissioner's Office, so the start of Laboratory services can be modified accordingly prior to the start of construction. Furthermore, the Testing Laboratory shall monitor its expenditures throughout the course of the job and notify immediately the Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC, and Engineer, of any significant deviation from the planned testing program and budget.

C. The Laboratory shall cooperate with the Gardner Spencer Smith Tench and Jarbeau, PC, Engineer, and Contractor, and provide qualified personnel promptly on notice.

D. The Laboratory shall perform the required inspections, sampling, and testing of materials as specified under each section, and observe methods of construction for compliance with the requirements of the Contract Documents.

E. The Laboratory shall notify Gardner Spencer Smith Tench and Jarbeau, PC and Contractor first by telephone and then in writing, of observed irregulantles and deficiencies of the work and other conditions not in compliance with the requirements of the Contract Documents.

1.05 CONTRACTOR'S GENERAL RESPONSIBILITIES

A. Cooperate with Testing Agency personnel. Provide access to the Work and to material supplier's plant and operations.

B. Provide representative samples of materials proposed for use in the Work, in quantities sufficient for accurate testing as specified.

C. Submit copies of Mill Test reports.

D. Furnish casual labor and facilities:
   1. To provide access to Work to be tested or inspected.
   2. To obtain and handle samples at the site under the direction of the Testing Agency.
   3. To facilitate inspections and tests.

E. Notify Testing Agency sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

F. Furnish and pay for the following:
   1. Soil survey of location of borrow soil materials, samples of existing soil materials, delivered to the Testing Agency.

2. Certification of reinforcing steel mill order.
3. Certifications and tests of post-tensioning materials.
4. Certification of Portland cement.
5. Weld procedure qualification tests.
6. Tests and samples when source of material changed after original test or inspection has been made.
7. Samples and mock-ups of substitute material, when the substitution is requested by Contractor and the tests are necessary, in the opinion of Gardner Spencer Smith Tench and Jarbeau, PC, to establish equality with specified items.
8. Provide and maintain, for the sole use of the Testing Agency, adequate facilities for safe storage and proper curing of such test specimens which must remain on the project site prior to testing.

G. Neither the observations, inspections, tests or approvals by Gardner Spencer Smith Tench and Jarbeau, PC or the Testing Agency shall relieve Contractor from his obligation to perform the Work in accordance with the Contract Documents.

H. Contractor shall notify Gardner Spencer Smith Tench and Jarbeau, PC in writing and receive a written reply prior to proceeding with additional testing beyond that specified in the Contract Documents.

I. Contractor shall designate one individual in his organization to be responsible for conducting Contractor's duties relative to testing. The individual so identified will be instructed in his duties by the Testing Agency. The individual shall not be changed without notice to Gardner Spencer Smith Tench and Jarbeau, PC.

1.06 AUTHORITY OF DESIGNATED TESTING AGENCY PERSONNEL

A. When requested by Gardner Spencer Smith Tench and Jarbeau, PC, the Testing Agency will render professional opinions regarding corrective measures for construction deficiencies.

B. The Testing Agency is not authorized to revoke or change requirements of the Contract Documents or to approve or accept any portion of the Work.

1.07 REPORTS

A. The Testing Agency shall submit one copy each of reports of tests and inspection and certification as required herein to Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC and engineering consultant, as applicable, for information only.

B. Copies of test reports shall be distributed within three working days after each date of test or inspection.

C. Tests and inspection reports will be in standard outline form including the following:
1. Issue date.
2. Project title and number.
3. Testing Agency name and address.
4. Name of technician.
5. Signature of reviewing registered engineer.
6. Date of inspection or sampling.
7. Significant weather conditions.
8. Report number.
9. Sample number.
10. Location in project.
11. Observations regarding compliance with Contract Documents.
12. Pertinent remarks.

D. Field reports shall include the following items:
1. Items inspected.
2. Specific location of the inspection.

3. Explanation of deficiencies or non-conforming installations.
4. Listing of parties informed and corrections made.
5. A statement certifying that the final inspection proved the installation to be in accordance with the Contract Documents.

E. Upon completion of the job, the Testing Laboratory shall furnish to the Union County Commissioner's Office, Gardner Spencer Smith Tench and Jarbeau, PC and Engineer of responsibility, a statement certified by a Notary Public that all required tests and inspections were made in accordance with the requirements of the Contract Documents.

1.08 EXTENT OF SERVICES FOR EARTHWORK

A. Moisture Density Relationship for Natural and Fill Materials:
1. The Testing Laboratory will provide one (1) optimum moisture density curve for each type of soil, natural, imported fill, or on-site fill, encountered in subgrade and fills under building slabs and paved areas. Curves shall be generated in accordance with ASTM 0698.

B. Control Testing Required During Construction:
1. The Testing Laboratory shall inspect and, approve the following subgrades and fill layers before further construction work is performed thereon:
   a. Paved Areas and Building Slab Subgrade: Make at least one (1) field density test of the natural density test of the natural subgrade for every 2,500 square feet of paved area or building slab, but in no case less than three (3) tests. In each compacted fill layer, make one (1) field density test for every 2,500 square feet of building slab on paved area, but in no case less than three (3) tests.
   b. Foundation Wall Backfill: Make at least one (1) field density test for each 200 lineal feet of all with a minimum of four (4) tests for each basement wall around the perimeter of the building and a minimum of one (1) test for every other type of foundation wall on the site. Tests shall be at random locations and elevations for each wall.
2. Field Density Tests shall be run according to ASTM 01556 (Density of Soil in Place by the Sand Cone Method), ASTM 02167) (Density of Soil in Place by the Rubber Balloon Method) or ASTM 02922 (Density of Soil and Soil Aggregate in Place by Nuclear Methods) as applicable.
3. The results of field density tests by the Testing Laboratory will not be considered satisfactory unless their value meet the required density.
4. The Testing Laboratory shall submit all moisture density curves and results of field density tests to the parties listed herein.
5. If reports by the Testing Laboratory indicate field densities lower than specified above, additional tests will be run by the Testing Laboratory with at least the frequencies scheduled above on re-compacted fill and/or natural subgrade. The Testing Laboratory shall notify the Contractor on a timely basis for any required re-testing so as not to delay the work. The costs of such tests shall be borne by the Contractor.
6. The Geotechnical Engineer shall provide inspection service of each dug footing subgrade prior to pouring foundation concrete. Such inspection shall verify that field conditions are consistent with soil report test results and that the foundation is being installed in the proper soil strata at the proper elevation. The Geotechnical Engineer shall submit written field inspection reports promptly after inspection to all parties listed herein, and report his findings after each inspection by telephone to the Structural Engineer.

C. Procedures for the Initiation of a Change Order for Removal of Rock or Unsuitable Soil:
1. Union County Commissioner's Office's testing laboratory soils engineer will confirm the existence of rock or unsuitable soil as defined in the contract documents.
2. Union County Commissioner's Office's surveyor will survey the area from which the material will be removed.
3. Contractor will remove the material.

4. Union County Commissioner's Office's surveyor will measure the area of the removed material to determine the total cubic yards.
5. Contractor will be paid by Change Order based on the unit cost amounts in the contract, which were accepted from the bid proposal, or as subsequently negotiated.

1.09 EXTENT OF SERVICE FOR CONCRETE MATERIALS AND POURED N-PLACE CONCRETE

A. Concrete Test Cylinders:
1. Cylinders for strength tests shall be molded and laboratory cured in accordance with ASTM C31 "Method of Making and Curing Concrete Test Cylinders in the Field" and tested in accordance with ASTM C39 "Method of Testing for Compressive Strength of Cylindrical Concrete Specimens."
2. Field samples for strength tests shall be taken in accordance with ASTM C172 "Method of Sampling Fresh Concrete".
3. Frequency of Testing: Each set of test cylinders shall consist of a minimum of four (4) standard test cylinders. A set of test cylinders shall be made according to the following frequency:
    a. One (1) set for each class of concrete taken not less than once a day.
    b. For walls and floors, one (1) set for each 100 cubic yards or fraction thereof not less than one (1) set for each 5,000 square feet of surface area.
    c. For columns, one (1) set for each 150 cubic yards or fraction thereof with a minimum of two (2) sets per floor.
    d. For all other concrete, a minimum of one (1) set for each 100 cubic yards or fraction thereof.
    e. No more than one (1) set of cylinders at a time shall be made from any single truck.
    f. If the total volume of concrete is such that the frequency of testing as specified above would provide less than five (5) strength tests for a given class of concrete, tests shall be made from at least five (5) randomly selected batches or from each batch if fewer than five batches are used.
    g. The above frequencies assume that one (1) batch plant will be used for each pour. If more than one (1) batch plant is used, the frequencies cited above shall apply for each plant used.
4. The cylinders shall be numbered, dated, and the point of concrete placement in the building recorded. Of the four (4) cylinders per set, break one at seven days, two at 28 days, and one automatically at 56 days if either 28 day cylinder break is below required strength. One (1) additional cylinder per set will be required for formed slab and pan joist floors for the purpose of evaluating the concrete strength at the time of form stripping.
5. This cylinder shall be stored on the floor where form removal is to occur under the same exposure conditions as the floor concrete.
6. This cylinder shall be cured under field conditions in accordance with ASTM C31 "Method of Making and Curing Concrete Test Specimen in the Field". Field cured test cylinders shall be molded at the same time and from the same samples as laboratory cured test specimens. This cylinder shall be broken at the time of form removal as directed by Contractor.
7. For concrete with design strength in excess of 5,000 PSI, Contractor shall be responsible for providing a temperature controlled and protected concrete cylinder storage box at a point on the job site mutually agreeable with the Testing Laboratory for the purpose of storing concrete cylinders until they are transported to the Laboratory.
8. The Testing Laboratory shall be responsible for transporting the cylinders to the Laboratory in a protected environment such that no damage or ill effect will occur to the concrete cylinders.
9. The Testing Laboratory shall make and distribute concrete test reports after each job cylinder is broken. Such reports shall contain the following information:
    a. Truck number and ticket number.
    b. Concrete Batch Plant.

c. Mix design number.
d. Accurate location of pour in the structure.
e. Strength requirement.
f. Date cylinders made and broken.
g. Technician making cylinders.
h. Concrete temperature at placing.
i. Air temperature at point of placement in the structure.
j. Amount of water added to the truck at the batch plant and at the site.
k. Slump..
l. Unit weight.
m. Air content.
n. Cylinder compressive strengths with type of failure if concrete does not meet Specification requirements, Seven (7) day breaks are to be flagged if they are less than 70% of the required, 28 day strength. 28 day breaks are to be flagged if either cylinder fails to meet Specification requirements.

B. Other Tests of Concrete Required by the Testing Laboratory:
1. Slump tests (ASTM C143) shall be made at the beginning of concrete placement for each batch plant and for each set of test cylinders made.
2. Air entrainment (ASTM C233) tests shall be made at the same time slump tests are made as cited above.
3. Concrete Temperature at placement at the same time slump tests are made as cited above.

C. Evaluation and Acceptance of Concrete:
1. A strength test shall be defined as the average strength of two (2) 28-day cylinder breaks from each set of cylinders.
2. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:
a. The average of all sets of three (3) consecutive strength tests equal or exceed the required f'c.
b. No individual strength tests (average of two (2) 28-day cylinder breaks) fall below the required f'c by more than 500 PSI.
c. If either of the above requirements is not met, the Testing Laboratory shall immediately notify the Engineer by telephone. Steps shall immediately be taken to increase the average of subsequent strength tests.

D. Investigation of Low Strength Concrete Test Results:
1. If any strength test of laboratory cured cylinders fall below the required f'c by more than 500 PSI, the Contractor shall take steps immediately to assure that the load carrying capacity of the structure is not jeopardized.
2. The Testing Laboratory shall, under the direction of the Engineer, perform non-destructive field test of the concrete in question using Swiss Hammer, Windsor Probe, or other appropriate methods and report the results the same as for cylinder test reports.
3. If the likelihood of low strength concrete is confirmed and computations indicate that the load carrying capacity of the structure has been significantly reduced, tests of cores drilled from the area in question under the direction of the Engineer will be required in accordance with ASTM C42 (Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete). In such case, three (3) cores shall be taken for each strength test more than 500 PSI below required f'c. If concrete in the structure will be dry under service conditions, cores shall be air dried (temperature 60 degrees to 80 degrees, relatively humidity less than 60 percent) for seven (7) days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 48 hours and tested wet. Contractor shall fill all holes made by drilling cores with an approved dry-pack concrete.

4. Concrete in an area represented by core test shall be considered structurally adequate if the average of three (3) cores is equal to at least 85% of f'c and if no single core is less than 75% of f'c. To check testing accuracy, locations of erratic core strengths may be re-tested.
5. If the above criteria are not met, and the structure adequacy remains in doubt, the Engineer may order a load test, as specified in ACI 318 for the questionable portion of the structure.
6. If the structural adequacy of the affected portion of the structure remains in doubt, the Engineer may order the structure to be strengthened by an appropriate means or torn down and re-built.
7. The costs of all investigations of low strength concrete shall be borne by Contractor.

E. Job Site Inspection by the Testing Laboratory:
1. The scope of the work to be performed by the inspector on the job site shall be as follows:
    a. Verify that air temperatures at the point of placement in the structure are within acceptable limits as specified prior to ordering of concrete by the Contractor.
    b. Inspect concrete upon arrival to verify that the proper concrete mix number, type of concrete, and concrete strength is being placed at the proper location.
    c. Inspect plastic concrete upon arrival at the job site to verify proper batching. The responsibility for adding water to trucks at the job site shall rest only with a duly appointed representative mutually agreeable to the Contractor, Union County Commissioner's Office, and Engineer, prior to the start of any concrete operations.
    d. Obtain concrete test cylinders as specified.
    e. Perform slump tests and air entrainment tests as specified.
    f. Record information for concrete test reports as specified.
    g. Verify that all concrete being placed meets job Specifications. Reject concrete not meeting the specified requirements and immediately notify Contractor, Batch Plant Inspector, Gardner Spencer Smith Tench and Jarbeau, PC, Engineer, and Union County Commissioner's Office.
    h. Pick up and transport to Laboratory, cylinders cast the previous day.
    i. Check concrete placing techniques to determine that concrete deposited is uniform and that vertical drop does not exceed six feet.
    j. The job site inspector shall report any irregularities that occur in the concrete at the job site or test results to Contractor, Gardner Spencer Smith Tench and Jarbeau, PC, Union County Commissioner's Office, and Engineer.

F. Causes for Rejection of Concrete Delivered to the Site:
1. A duly appointed representative agreeable to the Gardner Spencer Smith Tench and Jarbeau, PC, Union County Commissioner's Office and Engineer, shall reject all concrete delivered to the site for any of the following reasons:
    a. Wrong class of concrete (incorrect mix design number).
    b. Air Temperature: Air temperature limits shall be as follows:
        1) Cold Weather: Air temperature must be 40°F. and rising.
        2) Hot Weather: Air temperature must be cooler than 100°F.
        3) Concrete may be placed at other air temperature ranges only with approval to the duly appointed representative.
    c. Concrete with temperatures exceeding 95°F may not be placed in the structure without approval of the job inspector for the Testing Laboratory or other duly appointed representative.
    d. Air contents outside the limits specified in the mix designs.
    e. Slumps outside the limits specified or the mix design.
    f. Excessive Age: Concrete shall be discharged within 90 minutes of plant departure or before it begins to set if sooner than 90 minutes unless approved by the Laboratory job inspector or other duly appointed representative.

1.10 EXTENT OF SERVICES FOR STRUCTURAL STEEL AND RELATED WORK

A. Union County Commissioner's Office Responsibility: Union County Commissioner's Office shall pay for all initial shop and field inspections and tests as required during, the fabrication and erection of the structural steel.

B. Contractor Responsibility: Contractor shall pay for and arrange with the Testing Laboratory for the certification of all shop and field welders. The costs of all re-testing of material or workmanship not in conformance with the Contract Documents shall be borne by Contractor.

C. The Fabricator and Erector shall provide the laboratory inspector with access to all places where work is being done. A minimum of 24 hours notification shall be given prior to commencement of work.

D. Testing Laboratory Responsibility: The inspection of shop work by the Testing Laboratory shall be performed in the Fabricator's shop to the fullest extent possible. Such inspections shall be in sequence, timely, and performed in such a manner as to minimize disruptions in operations and to permit the repair of all non-conforming work while the materials in process in the fabricating shop. Inspection of field work shall be completed promptly so that corrections can be made without delaying the progress of the work. The Testing Laboratory shall provide test reports of all shop and field inspections. Shop test reports shall include shop welders certifications.

E. All test reports shall indicate types and locations of all defects found during inspection, the performed to correct such defects, statements of final measures required and approval of all welding and bolting of shop and field In addition to the parties listed, the fabricator and erector shall receive copies of all test reports.

F. Gardner Spencer Smith Tench and Jarbeau, PC, Engineer, and Testing Laboratory reserve the right to reject any material or workmanship not in conformance with the Contract Documents at any time during the progress of the work. However, this provision does not allow waiving the obligation for timely, in sequence inspection.

G. Mill Tests of Structural Steel:
   1. Mill Order Steel: The Fabricator shall furnish certified mill test reports and an affidavit stating that the structural steel furnished meets the requirements of the grade specified on the structural drawings for all mill order steel. In case of controversy, certified reports of tests, according to ASTM A6 or A568 as applicable, made by the Union County Commissioner's Office's Testing Laboratory, paid for by the Contractor, shall be made to verify conformity with ASTM standards.
   2. Local Stock Steel: Materials taken from stock by a Fabricator for use for structural purposes must be of a quality at least equal to that required by the ASTM specifications applicable to the classification covering the Intended use.
   3. Certified mill test reports shall be accepted as sufficient record of the quality of materials carried in stock by the fabricator. In case of controversy, certified reports as specified for mill order steel shall be required.
   4. If tests are required, test specimens shall be taken by Contractor under the direction of the Testing Laboratory and shall be machined by the Testing Laboratory to dimensions as required by the applicable ASTM standards.

H. Shop Inspections and Tests: The Testing Laboratory shall provide inspection at the designated fabrication shops for the designated periods of time to perform shop inspection and tests. The designated fabrication shops and time periods of inspections shall be determined in consultation with Gardner Spencer Smith Tench and Jarbeau, PC, Union County Commissioner's Office, and Engineer prior to the start of fabrication in a timely manner so as not to delay the fabrication process. The following tests and inspections shall be performed:
   1. Review shop drawings and shop procedures with fabricator's supervisory personnel.
   2. Review welding procedures and obtain welder certificates.
   3. Verify welding electrodes to be used and other welding consumables as the job progresses.

4. Provide inspection of surface preparation for coating and coating operations.

I. Inspections and Tests: The Testing Laboratory shall provide inspection in the field for a period of time as determined in consultation with Gardner Spencer Smith Tench and Jarbeau, PC, Union County Commissioner's Office, and Engineer prior to the start of erection in a timely manner so as to not delay the start of erection. The following tests and inspections shall be made:
   1. Obtain the planned erection procedure, and review with the Erector's supervisory personnel.
   2. Check the installation of base plates for proper leveling grout type, and grout application.
   3. Verify field welding procedures and obtain welder certificates.
   4. Check steel as received in the field for possible shipping damage, workmanship, and piece marking.
   5. Check plumbing and frame alignment as erection progresses.
   6. Check required camber of floor beams.
   7. Check joint preparation and fit up, backing strips, and run-out plates for welded moment connections and column splices.
   8. Check pre-heating to assure proper temperature, uniformity and thoroughness through the full material thickness.
   9. Review welding sequence.
   10. Visually inspect field welding for size, length, and quality.
   11. Perform non-destructive examination services for various weldments of field erection determined in consultation with the Structural Engineer prior to the start of erection. The laboratory shall furnish a qualified technician with the necessary equipment to perform radiographic, ultrasonic, magnetic particle, or dye penetrant inspection as required for the item being tested and other duties as outlined for shop inspection.
   12. Check calibration of impact wrenches used in field bolted connections.
   13. Check high strength field bolted connections according to inspection procedures outlined in the "Specification for Structural Joints Using ASTM A325 or A490 Bolts". Unless specified otherwise, test one (1) bolt in 10% of the bolted connections. If that bolt is found to be improperly tightened, test all bolts in the connection.
   14. Visually inspect the welding of metal deck to the structure.
   15. Perform field tests on 10% of completed shear connectors according to inspection procedures outlined in AWS 01.1.

1.11 EXTENT OF SERVICES FOR ASPHALTIC CONCRETE

A. Make one laboratory density and stability test on each type of asphaltic concrete for each day's operation in accordance with ASTM 01559. Provide one test per 5000 sf surface area.

B. Make one extraction and gradation test on each type of asphaltic concrete for each day's operation in accordance with ASTM 02726.

PART 2 PRODUCT - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 7310
CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for cutting and patching.

1.02 RELATED REQUIREMENTS

A. Divisions 02 through 14 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
   1. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 21-23 and 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

B. Section 01 1000 - Summary: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.

C. Section 01 2000 - Price and Payment Procedures: Applications for payment, Schedule of Values, modifications procedures, closeout procedures.

D. Section 01 2100 - Allowances: Cash, testing, and contingency allowances.

E. Section 01 2200 - Unit Prices: Descriptions of unit price items, administrative requirements.

F. Section 01 2300 - Alternates: Descriptions of items, administrative requirements.

G. Section 01 3000 - Administrative Requirements: Submittal procedures, project meetings, progress schedules and documentation, reports, coordination.

H. Section 01 4000 - Quality Requirements: Procedures for testing, inspection, mock-ups, reports, certificates; use of reference standards.

I. Section 01 5000 - Temporary Facilities and Controls.

J. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

K. Section 01 7000 - Execution Requirements: Examination, preparation, and general installation procedures; preinstallation meetings; cutting and patching; cleaning and protection; starting of systems; demonstration and instruction; closeout procedures except payment procedures; requirements for alterations work.

L. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance.

M. Division 07 Section "Through-penetration Firestop Systems" for patching fire-rated construction.

1.03 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

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

1.04 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
   1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
   2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
   3. Products: List products to be used and firms or entities that will perform the Work.

4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Gardner Spencer Smith Tench and Jarbeau, PC's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

B. Request for Utility Interruption: Where utilities are to be interrupted, submit the "Request for Department - Utility Interruption" form, at the end of this section for review and approval by the Union County Commissioner's Office.

1.05 QUALITY ASSURANCE

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

B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems.
7. Electrical wiring systems.
8. Operating systems of special construction in Division 13 Sections.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Gardner Spencer Smith Tench and Jarbeau, PC's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
    a. Processed concrete finishes.
    b. Stonework and stone masonry.
    c. Ornamental metal.
    d. Matched-veneer woodwork.
    e. Preformed metal panels.
    f. Roofing.

g. Firestopping.
h. Window wall system.
i. Finished wood flooring.
j. Fluid-applied flooring.
k. HVAC enclosures, cabinets, or covers.

1.06 WARRANTY

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

PART 2 PRODUCTS

2.01 MATERIALS

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

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.02 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 Project that might be exposed during cutting and patching operations.

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

3.03 PERFORMANCE

A. General: Employ skilled workers 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, and subsequently patch as required to restore surfaces to the original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding , not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 32 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.04 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 coverings to their original condition.

3.05 ATTACHMENTS

REQUEST FOR DEPARTMENT-UTILITY INTERRUPTION

DATE: _____ REQUEST NO.:_____

****

PROPOSED INTERRUPTION: FROM: (DATE)_____

(TIME)_____

TO:(DATE)_____

(TIME)_____

****

APPROVALS NEEDED:

_____DATE:_____

_____DATE:_____

_____DATE:_____

_____DATE:_____

****

PLEASE INDICATE THE TYPE OF UTILITY TO BE AFFECTED:

[ ] WATER[ ] ELECTRIC[ ] PHONE[ ]GASES

[ ] HVAC[ ] SEWER[ ] EXHAUST[ ]VACUUM

[ ] ALARM[ ] OTHER_____

****

LOCATION OF THE UTILITY WORK TO BE DONE:_____

_____

_____

****

COPIES:

SUB-CONTRACTOR:

NOTES:

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.
   1. Record drawings.
   2. Record project manual (specifications).
   3. Record submittals:
      a. Shop drawings.
      b. Product data.

B. Operation and Maintenance Data.

C. Warranties and bonds.

D. Final cleaning.

1.02 RELATED REQUIREMENTS

A. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

B. Division 01 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.

C. Division 01 Section "Execution Requirements" for progress cleaning of Project site.

D. Divisions 02 through 26 Sections for specific closeout and special cleaning requirements for products of those Sections.

E. Section 00 7200 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

F. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

G. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

H. Individual Product Sections: Specific requirements for operation and maintenance data.

I. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Gardner Spencer Smith Tench and Jarbeau, PC with claim for final Application for Payment.
   1. Record drawings: Submit in form of opaque bond prints.
      a. Submit original marked-up set.
      b. Submit three (3) additional opaque bond print copy sets.
      c. Sets shall include all drawings whether changed or not.
   2. Other record documents: Submit originals or good quality photocopies.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Gardner Spencer Smith Tench and Jarbeau, PC will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Union County Commissioner's Office, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Gardner Spencer Smith Tench and Jarbeau, PC comments. Revise content of all document sets as required prior to final

submission.

4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Union County Commissioner's Office's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.04 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise Union County Commissioner's Office of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit releases permitting Union County Commissioner's Office unrestricted Use of the. Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
   6. Deliver tools, spare parts, extra materials, and similar items to location designated by Union County Commissioner's Office. Label with manufacturer's name and model number where applicable.
   7. Make final changeover of permanent locks and deliver keys to Union County Commissioner's Office. Advise Union County Commissioner's Office's personnel of changeover in security provisions.
   8. Complete startup testing of systems.
   9. Submit test/adjust/balance records bearing Gardner Spencer Smith Tench and Jarbeau, PC's approval without exception.
   10. Terminate and remove temporary facilities from Project site, along with mockups, Project signs, construction tools, and similar elements.
   11. Advise Union County Commissioner's Office of changeover in heat and other utilities.
   12. Submit changeover information related to Union County Commissioner's Office's occupancy, use, operation, and maintenance.
   13. Complete final cleaning requirements, including touchup painting.
   14. Touch up and otherwise repair and restore marred exposed finished to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Gardner Spencer Smith Tench and Jarbeau, PC will either proceed with inspection or notify Contractor of unfulfilled requirements. Gardner Spencer Smith Tench and Jarbeau, PC will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Gardner Spencer Smith Tench and Jarbeau, PC, that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Final Completion.

1.05 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
   2. Submit certified copy of Gardner Spencer Smith Tench and Jarbeau, PC's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Gardner Spencer Smith Tench and Jarbeau, PC. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest-control final inspection report and warranty.
   5. Instruct Union County Commissioner's Office's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Gardner Spencer Smith Tench and Jarbeau, PC will either proceed with inspection or notify Contractor of unfulfilled requirements. Gardner Spencer Smith Tench and Jarbeau, PC will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.06 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Page number.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
      a. Keep drawings in labelled, bound sets.
         1) Mark with red pencil.
         2) Mark work of separate contracts with different colors of pencils.
         3) Incorporate new drawings into existing sets, as they are issued.
      b. When the contractor is required by a provision of a modification to prepare a new drawing, rather than to revise existing drawings, obtain instruction from Gardner Spencer Smith Tench and Jarbeau, PC for drawing scale and information required.
   2. Specifications.
      a. Maintain a complete copy of the project manual, marked to show changes.
   3. Addenda.

4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Union County Commissioner's Office.

C. Store record documents separate from documents used for construction.

D. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.
4. Measured depths of foundations in relation to finish first floor datum.
5. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
6. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
    a. Actual routings of piping and conduits.
    b. Revisions to electrical circuits.
    c. Sizes and routings of ducts.
    d. Actual equipment locations.
7. Particulars on concealed products which will not be easy to identify later.
8. Field changes of dimension and detail.
9. Details not on original Contract drawings.
    a. Note changes made by modifications to the contract; include identification numbers if applicable.
10. New information which may be useful to the Owner, but which was not shown in either the contract documents or submittals.

E. Record Submittals
1. Maintain a complete set of all submittals made during construction, marked to show changes.
    a. Maintain submittals in cardboard file boxes, labeled to show contents.
    b. Sort submittals by applicable specification section and file in order of submittal a identification number.
2. Record Shop Drawings: Record the types of information specified for all record documents.
    a. Mark changes on record shop drawings only when contract drawing would not be capable of showing the change clearly or completely.
    b. Mark changes in manner specified for record drawings.
3. Record Product Data Submittals: Record the types of information specified for all record documents.
    a. In addition, record the following types of information:
        1) Changes in the products as delivered to the site.
        2) Changes in manufacturer's instructions or recommendations for installation.
4. Record Coordination Drawings: Record the types of information required for all record documents.
    a. Mark up in the manner specified for record drawings.

F. Gardner Spencer Smith Tench and Jarbeau, PC will make the original contract drawings available to the Contractor for printing transparencies.

G. Where record drawings are also required as part of operation and maintenance data submittals, make copies from the original record drawing set.

H. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

3.02 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Union County Commissioner's Office's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
   1. In addition to binders, all Operation & Maintenance documentation will be submitted on CD.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Gardner Spencer Smith Tench and Jarbeau, PC, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Gardner Spencer Smith Tench and Jarbeau, PC, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:

a. Shop drawings and product data.
b. Air and water balance reports.
c. Certificates.
d. Photocopies of warranties and bonds.

N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

O. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Gardner Spencer Smith Tench and Jarbeau, PC , Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.03 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Union County Commissioner's Office's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
1. In addition to binders, all Warranty, Guarantee, and Bond documentation will be submitted on CD.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

3.04 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Union County Commissioner's Office's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Provide instructors experienced in operation and maintenance procedures.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Union County Commissioner's Office, through Gardner Spencer Smith Tench and Jarbeau, PC with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Contractor to provide an agenda of instruction for each system.

C. Contractor to provide an "Acknowledgement of Instruction" sign-in sheet for each system. Submit triplicate copies for file.

D. Contractor will video all Owner training sessions and submit two (2) CD's of each training session with Closeout Documents.

3.05 FINAL CLEANING

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

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

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits. Pressure wash as required to remove stains.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    h. Sweep concrete floors broom clean in unoccupied spaces.
    i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible sailor stains remain.
    j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    k. Remove labels that are not permanent.
    l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
        1) Do not paint over "UL" and similar labels, including mechanical and electrical name plates.
    m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    n. Replace parts subject to unusual operating conditions.
    o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grilles.
    q. Clean ducts, blowers, and coils if units were operational without filters during construction.
    r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
    s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pest. Prepare and submit a written report for file.

3.06 ATTACHMENTS

CHECK-OFF LIST

DOCUMENT NO. OF COPIES DATE RECEIVED

****

CONTRACTORS WARRANTY_____

SUBCONTRACTORS WARRANTY_____

STATUTORY AFFIDAVIT_____

NON-INFLUENCE AFFIDAVIT_____

INSPECTION REPORTS_____

BUILDING_____

PLUMBING_____

ELECTRICAL_____

HEALTH_____

FIRE MARSHAL OCCUPANCY CERTIFICATE _____

AS-BUILT DRAWINGS_____

MAINTENANCE MANUALS_____

SPECIAL WARRANTIES_____

CERTIFICATE OF SUB. COMPLETION*_____

CERTIFICATE OF COMPLETION**_____

I certify that, being familiar with the Contract Documents for this project, to the best of my knowledge, the items checked off herein above constitute all that are applicable to this project.

Date submitted to Gardner Spencer Smith Tench and Jarbeau, PC. _____

Date submitted to the Union County Commissioner's Office._____

CONTRACTOR_____

* Submit following Owner's acceptance of building for use.

** Hold all other documents and submit in a package when all requirements are complete. (No exceptions, piecemeal submittal will be returned.)

WARRANTY BY CONTRACTOR

****

OWNER: Union County Commissioner's Office

JOB NAME:_____

ADDRESS:_____

COUNTY OF:_____

STATE OF:_____

DATE:_____

_____, as General Contractor on the above job does hereby guarantee that all work executed under the plans and Specifications will be free from defects of materials and/or workmanship for a period of _____Year(s), beginning_____and ending_____and that all defects occurring within the warranty period shall be replaced or repaired at no cost to Union County Commissioner's Office.

This guarantee covers all work as shown on the plans and specified in the Specifications and Contract Documents.

LEGAL NAME OF CONTRACTOR

_____

By:_____

Title:_____

_____

Notary Public

This ____day of_____, 20____.

WARRANTY BY SUBCONTRACTOR

****

OWNER: Union County Commissioner's Office

JOB NAME:_____

ADDRESS:_____

COUNTY OF:_____

STATE OF:_____

DATE:_____

_____, as Sub-Contractor on the above job does hereby guarantee that all work executed under the plans and Specifications will be free from defects of materials and/or workmanship for a period of _____Year(s), beginning_____and ending_____and that all defects occurring within the warranty period shall be replaced or repaired at no cost to Union County Commissioner's Office.

This guarantee covers all work as shown on the plans and specified in the Specifications and Contract Documents.

LEGAL NAME OF SUBCONTRACTOR

_____

By:_____

Title:_____

_____

Notary Public

This ____day of_____, 20____.

END OF SECTION

SECTION 01 7875
FINAL CLEANING

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.

B. Section 01 2000 - Price and Payment Procedures: Applications for payment, Schedule of Values, modifications procedures, closeout procedures.

C. Section 01 2100 - Allowances: Cash, testing, and contingency allowances.

D. Section 01 2200 - Unit Prices: Descriptions of unit price items, administrative requirements.

E. Section 01 2300 - Alternates: Descriptions of items, administrative requirements.

F. Section 01 3000 - Administrative Requirements: Submittal procedures, project meetings, progress schedules and documentation, reports, coordination.

G. Section 01 4000 - Quality Requirements: Procedures for testing, inspection, mock-ups, reports, certificates; use of reference standards.

H. Section 01 5000 - Temporary Facilities and Controls.

I. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

J. Section 01 7000 - Execution and Closeout Requirements: Examination, preparation, and general installation procedures; preinstallation meetings; cutting and patching; cleaning and protection; starting of systems; demonstration and instruction; closeout procedures except payment procedures; requirements for alterations work.

K. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.

1.02 DEFINITIONS

A. Final Cleaning is hereby defined to include the general requirements near the end of the Contract Time, in preparation for final acceptance, final payment, normal termination of the Contract, occupancy by the Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in the sections of Division 01 through 48. The time of final cleaning is recognized to be directly related to "Substantial Completion", and therefore may be either a single time period for the entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates.

B. Final Cleaning includes all work associated with remedial cleaning required after any work of the contractor, regardless of when the work was completed.

1.03 SUBSTANTIAL COMPLETION

A. Prior to requesting Gardner Spencer Smith Tench and Jarbeau, PC's inspection for certification of Substantial Completion (for either the entire work or portions thereof), Final Cleaning must be complete and list all known exceptions in the request.

1.04 CERTIFICATION OF FINAL ACCEPTANCE

A. Prior to requesting Gardner Spencer Smith Tench and Jarbeau, PC's final inspection for certification of final acceptance and final payment, as required by the General Conditions, complete the following and list known exceptions (if any) in request.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 FINAL CLEANING OF NEW FACILITIES OR ADDITIONS

A. General: Special cleaning for specific units of work is specified in the Sections of Division 02 through 48.

B. Provide final cleaning of the Work as part of the project being declared substantially complete. Contractor is responsible for providing any additional cleaning for any work performed as part of his contract after acceptance of final cleaning. Final clean consists of cleaning each surface or unit of work to the normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples, but not by way of limitation, of the cleaning levels required:
   1. Remove labels which are not required as permanent labels.
   2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass.
   3. Clean exposed exterior and interior hard-surfaced finishes, including metals,
      a. masonry, concrete, painted surfaces, plastics, tile, wood, special coatings, and similar surfaces, to a dirt free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid the disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
   4. Wipe surfaces of mechanical and electrical equipment clean, including equipment in addition to that specified in Division 23 and 26; remove excess lubrication and other substances.
   5. Remove debris and surface dust from limited-access spaces including roofs, plenums shafts, trenches, equipment vaults, manholes, attics and similar spaces.
   6. Clean concrete floors in non-occupied spaces broom clean.
   7. Vacuum clean carpeted surfaces and similar soft surfaces.
   8. Vinyl Flooring: Sweep dust and debris from all vinyl floor tiles. See cleaning and protection instructions in Division 09 Section "Resilient Flooring".
   9. Restrooms: Clean walls beginning at top of walls and work down, cleaning attached fixtures, partitions and floor mounted fixtures. Scrub and sanitize flooring. Ensure all fixture drains and floor drains are free of construction debris and that they drain properly.
   10. Clean light fixtures and lamps so as to function with full efficiency.
   11. Clean project site (yard and grounds), including landscape, development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits. Rake grounds clean of all debris that accumulated as a result of the construction.

3.02 CONTINUING INSPECTIONS

A. Except as otherwise required by special guarantees, warranties, agreements to maintain, workmanship bonds, and similar continuing commitments, comply with the Owner's requests to participate in inspections at the end of each time period of such continuing commitments. Participate in the general inspection(s) of the work approximately one year beyond the date(s) of Substantial Completion.

END OF SECTION

SECTION 02 4300
MISCELLANEOUS WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Operations which cannot be specified in detail as separate items but can be sufficiently described as to the kind and extent of work involved. Furnish all labor, materials, equipment and incidentals to complete the work under this section.

B. The work includes, but is not limited to the following:
   1. Surveying as-built conditions for the purpose of obtaining required governmental approvals.
   2. Progress photographs.
   3. Incidental work.

1.02 RELATED SECTIONS

A. Division 01 - Application for Payment: Progress photographs.

B. Division 31 - Grading: Rough and finish grading.

C. Division 31 - Excavation: Excavating at new site.

1.03 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE

A. Qualifications: Company specializing in required fields with a minimum of three years of documented experience.

1.05 PROJECT CONDITIONS

A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

B. Arrange schedule with Union County Commissioner's Office's requirements , work of other sections , and final close-out documentation required for Substantial Completion of project.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Materials required for this section shall be same quality as materials that are restored. Where possible, reuse existing materials that have been removed.

B. Provide equipment to replicate same quality of work being replaced.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify utility services and obstructions to be removed, relocated, or abandoned during progress of the Work.

B. Damage Determination:
   1. Before restoration, inspect existing conditions thoroughly and notify Gardner Spencer Smith Tench and Jarbeau, PC in writing of visible defects and factors that could affect Substantial Completion of project..

3.02 INSTALLATION

A. Restoring of Sidewalks, Driveways, Aprons, Curbing, and Fencing:
   1. Existing public and private sidewalks and driveways disturbed shall be replaced. Paved sidewalks and drives shall be repaved to the limits and thickness existing prior to construction.

2. Existing curbing shall be protected. If necessary, curbing shall be removed and replace after backfilling. Curbing which is damaged during construction shall be replaced with curbing of equal quality and dimension.

B. Surveying As-Built Conditions:
   1. This item shall include any surveying required for work performed by the Contractor whether or not shown on the drawings, for obtaining required governmental approvals for final close-out documents and Substantial Completion.

C. Progress Photographs: Do not allow any cameras or photography on site unless authorized by the Union County Commissioner's Office and or is here-in required.
   1. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
   2. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
   3. Photography Type: Digital; electronic files.
   4. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Gardner Spencer Smith Tench and Jarbeau, PC.
   5. In addition to periodic, recurring views, take photographs of each of the following events:
   6. Take photographs during each phase and as follows:
      a. Completion of site clearing.
      b. Excavations in progress.
      c. Foundations in progress and upon completion.
      d. Structural framing in progress and upon completion.
      e. Enclosure of building, upon completion.
      f. Final completion, minimum of ten (10) photos.
   7. Views:
      a. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
      b. Consult with Gardner Spencer Smith Tench and Jarbeau, PC for instructions on views required.
      c. Provide factual presentation.
      d. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
      e. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
      f. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.
   8. Deliver prints and compact disk with each Application for Payment with transmittal letter specified in this Section.

D. Incidental Work:
   1. Do incidental work not otherwise specified or can be reasonably be anticipated, or is obviously necessary for the proper completion of the contract as specified and shown on the drawings.

3.03 CLEANING

A. Keep the work area and adjacent areas clean during the work. Remove all excess materials, debris, and equipment from site.

B. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

END OF SECTION

SECTION 03 1000
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 01 4110.

B. Section 03 2000 - Concrete Reinforcing.

C. Section 03 3000.

D. Section 04 0090: Spacing for masonry accessories recessed in concrete.

E. Division 05: Structural Steel; Placement of embedded steel anchors and plates in cast-in-place concrete.

F. Division 31: Earthwork; Shoring and underpinning for excavation.

1.03 REFERENCE STANDARDS

A. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).

B. ACI 301 - Specifications for Structural Concrete 2016.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary 2014 (Errata 2018).

D. ACI 347R - Guide to Formwork for Concrete 2014, with Errata (2017).

E. ASME A17.1 - Safety Code for Elevators and Escalators 2019.

F. PS 1 - Structural Plywood 2009 (Revised 2019).

1.04 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.05 SUBMITTALS

A. See Section 01 3200 - Construction Progress Documentation, for submittal procedures.

B. Product Data: Provide data on void form materials and installation requirements.

C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 347, ACI 301, and ACI 318.

B. Designer Qualifications: Design formwork under direct supervision of a Professional Structural Engineer experienced in design of concrete formwork and licensed in Georgia.

C. Plywood: Conform to tables for form design and strength in APA Form V 345.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

2.02 GENERAL

A. Form materials may be reused during progress of the Work provided they are completely cleaned and reconditioned, recoated for each use, capable of producing formwork of required quality, and are structurally sound.

B. Form Lumber: WCLIB Construction Grade or Better, WWPA No. 1 or Better.

C. Plywood: PS 1-95, Group I, Exterior Grade B-B Plyform or better, minimum 5-ply and 3/4 inch thick for exposed locations and at least 5/8 inch thick for unexposed locations, grade marked, not mill oiled. Furnished plywood with medium or high density overlay is permitted.

D. Coated Form Plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent Noxcrete", or equal.

E. Tube Forms: Burke "SmoothTube," Sonoco "Seamless Sonotubes," or Alton Building Products "Sleek Seamless Standard Wall," of the type leaving no marks in concrete, one-piece lengths for required heights.

F. Joist Forms: Code recognized steel or molded plastic types as required.

G. Special Forms: For exposed integrally-colored concrete, plywood as above with high density overlay, plywood with integral structural hardboard facing or fibrous glass reinforced plastic facing, providing specified finish.

H. For Exposed Concrete Finish:
   1. Plywood: New, waterproof, synthetic resin bonded, exterior type Douglas fir or Southern pine plywood manufactured especially for concrete formwork and conforming to NIST PS 1, BB grade, class I.
   2. Glass-Fiber-Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to structural tolerances and appearance of finished concrete surfaces.
   3. Steel: Minimum 16 gage sheet, well matched, tight fitting, stiffened to support weight of concrete, without deflection detrimental to tolerances and appearances of finished concrete surfaces.
   4. Plywood: "Finland Form," or "Combi Form" distributed by North American Plywood Corporation. The material shall be furnished with hard smooth birch face veneers with phenolic resin thermally fused onto panel sides. Edges shall be factory sealed.

I. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, not leaving metal within 1-1/2 inch of concrete surface.

J. Form Coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, "Formshield" by A.C. Horn, Inc., "Release" by Burke Concrete Accessories, or "Cast-Off" by

Sonneborn Building Products. Where form liners are furnished, provide form coatings recommended by form liner manufacturer.

K. Form Liner: Rigid or resilient type by L.M. Scofield, Labrado Forms, Symons, or Greenstreak.

L. Void Forms: Manufactured by SureVoid Products, Inc, or equal. Forms shall be "WallVoid" for temporary support of concrete walls and grade beams spanning between supports, and "SlabVoid" for creating gaps between concrete slabs or steps and underlying soils. Void forms shall be fabricated of corrugated paper with moisture resistant exterior, and shall be capable of withstanding working load of 1,500 psf. Provide accessories as required.

2.03 FORMWORK ACCESSORIES

A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Colorless mineral oil that will not stain concrete.

C. Corners: Filleted, rigid plastic type; 3/4 inch size; maximum possible lengths.

D. Dovetail Anchor Slot: Galvanized steel, 22 gage thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

E. Flashing Reglets: Galvanized steel, 22 gage thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

G. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 1200.

H. Waterstops: Rubber, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, 6 inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

1. Manufacturers:
    a. Paul Murphy Plastics Co., ribbed bulb, 6 inch.
    b. American Colloid Company, Waterstop RX, Butyl rubber bentonite compound rope, 25% composition.
    c. Synko - Flex Products, Inc. Superstop.
    d. Substitutions: See Division 01 - Product requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Do not use earth cuts for formed vertical surfaces unless approved by Gardner Spencer Smith Tench and Jarbeau, PC.

B. Where allowed, hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Forms shall be constructed so as to shape final concrete structure conforming to shape, lines and dimensions of members required by Drawings and Specifications, and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain position and shape. Forms and their supports shall be designed so that previously placed structures will not be damaged. Forms shall be true to line within a tolerance of plus-or-minus 1/250 of the span.

D. Plywood shall be installed with horizontal joints level, vertical joints plumb and with joints tight. Back joints by studs or solid blocking, and fill where necessary for smoothness. Reused plywood shall be thoroughly cleaned, damaged edges or surfaces repaired and both sides and edges oiled with colorless form oil. Nail plywood along edges, and to intermediate supports, with common wire nails spaced as necessary to maintain alignment and prevent warping.

E. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades and accurately place and securely support items to be built into forms.

F. Openings for Cleaning: Provide temporary openings at points in formwork to facilitate cleaning and inspection. At base of walls and wide piers, bottom form board on one face for entire length shall be omitted until form has been cleaned and inspected.

G. Preparation and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete.
   1. Form Surface Treatment:
      a. Before placing reinforcing steel or concrete, coat the form surfaces with a material that will effectively prevent absorption of moisture, prevent bond with concrete and not stain concrete.
      b. A field applied form release agent or factory applied non-absorptive liner material may be used.
      c. Do not allow form release agent to stand in puddles, come into contact with reinforcing steel or hardened concrete against which fresh concrete is to be placed.
   2. Remove loose metal, wood chips, sawdust, dirt, trash, and other debris just prior to concrete placement.
   3. Re-tighten forms during and immediately after concrete placement to eliminate leaks.

H. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

I. Align joints and make watertight. Keep form joints to a minimum.

J. Obtain approval before framing openings in structural members that are not indicated on drawings.

K. Provide fillet and chamfer strips on external corners of beams, joists, and columns.

L. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

M. Coordinate this section with other sections of work that require attachment of components to formwork.

N. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Gardner Spencer Smith Tench and Jarbeau, PC before proceeding.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water.

Keep surfaces coated prior to placement of concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Set and build into the work anchorage devices, inserts, and other embedded items required for material attached to or supported by cast-in-place concrete.

B. Use setting drawings, diagrams, instructions, and directions provided by suppliers items to be attached.

C. Do not place embedded items in any manner that will displace or interfere with the reinforcing steel.

D. Conduit:
   1. Embed all electrical conduit in slabs.
   2. Wire conduit inside layers of reinforcement.
   3. Wire conduit to reinforcement perpendicular to the conduit. Do not wire to parallel reinforcement.
   4. Separate parallel conduit by 2 inches, minimum.

E. Waterstops:
   1. Install in greatest continuous lengths possible.
   2. Do not displace concrete reinforcement.
   3. Splice waterstops in accordance with manufacturer's written recommendations.

F. Junction Boxes:
   1. Boxes of any depth may be located in slabs, beams and soffits, and headers.
   2. Do not locate in joist soffits.
   3. Provide header to accommodate junction boxes over 2 1/4 inches deep.

G. Provide formed openings where required for items to be embedded in passing through concrete work.

H. Locate and set in place items that will be cast directly into concrete.

I. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

J. Position recessed anchor slots for brick veneer masonry anchors to spacing and intervals specified in Division 04.

K. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

L. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.

M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

N. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.06 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.
   1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
   2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.07 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

C. Camber slabs and beams in accordance with ACI 301.

D. Construct formwork to provide completed cast-in-place concrete surfaces:
   1. Variation in depth of stair treads: 3/16 inch, maximum.
   2. Variation from level in slabs: +/- 1/4 inch in any 10 foot radius.
   3. Piers, Columns, and Walls:
      a. Variation in plan from straight lines parallel to specified linear building lines:
         1) 1/40 in/ft adjacent members less than 20 feet apart or any wall or bay length less than 20 feet.
         2) 1/2 inch adjacent members 20 feet or more apart or any wall or bay length 20 feet or more.
      b. Variation in elevation from lines parallel to specified grade lines:
         1) 1/40 in/ft adjacent members less than 20 feet apart or any wall or bay length less than 20 feet.
         2) 1/2 inch adjacent members 20 feet or more apart or any wall or bay length 20 feet or more.
      c. Variation in cross-sectional dimension of pan formed joist: Minus 1/4 inch, plus 1 1/2 inch.

3.08 RE-USE OF FORMS

A. Re-Use forms only when properly maintained and in condition to produce the formed finish required.

B. Do not re-use forms that cannot be tightly butted and made watertight.

C. Repair forms between uses:
   1. Align and tighten to provide secure and watertight joints and avoid offsets.
   2. Do not plug old tie holes that will not be reused.
   3. Replace materials containing unused tie holes.
   4. Split, frayed, delaminated or otherwise damaged form facing material is not acceptable.
   5. Do not use patched forms for exposed concrete surfaces unless approved by Gardner Spencer Smith Tench and Jarbeau, PC.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Division 01.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

3.10 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Forms shall not be removed until concrete has sufficiently hydrated to maintain its integrity and not be damaged by form removal operations. Unless noted otherwise and/or permitted by Gardner Spencer Smith Tench and Jarbeau, PC, columns and wall forms shall not be removed in less than 5 days, floor slabs in less than 7 days, beams and girders in less than 15 days, metal pan forms for joists may be removed after 3 days, but joist centering shall not be removed until after 15 days, and ramp, landing, steps and floor slabs shall not be removed in less than 7 days. Shoring shall not be removed until member has acquired sufficient strength to support its weight, load upon it, and added load of construction.

C. Compressive strength of in-place concrete shall be determined by testing field-cured specimens representative of concrete location or members, as specified in Section 03 3000.

D. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

E. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

3.11 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.12 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 04 0070
CEMENT GROUT FOR REINFORCED MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grout for masonry.

1.02 RELATED SECTIONS

A. Division 01 - Testing and Inspection.

B. Section 040090 - Masonry Accessories.

C. Section 042200 - Concrete Unit Masonry: Installation of mortar and grout.

D. Section 081113 - Steel Doors and Frames: Grouting steel door frames installed in masonry.

1.03 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C 270 is to be used. Also include required environmental conditions and admixture limitations.

C. Shop Drawings: Show fabrication and installation details for the following:
   1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

D. Reports: Submit reports on grout indicating conformance of component grout materials to requirements of ASTM C 476 and test and evaluation reports to requirements of ASTM C 1019.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
   1. Each cement product required for mortar and grout, including name of manufacturer, brand type, and weight slips at time of delivery.
   2. Each material and grade indicated for reinforcing bars.

1.04 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.

B. For each type and color of cement specified, only one brand shall be used throughout project.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

B. Deliver materials, except aggregate, in original unopened containers displaying product name, type, grade and mixing instructions.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C 150, Type I - Normal; standard gray color.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate:
   1. Fine Grout: Meeting ASTM C404, fine aggregate, size #1.
   2. Course grout: Meeting ASTM C33, size #7, Maximum.

D. Superplasticizing admixture for cement grout:
   1. Acceptable products:
      a. Anti-Hydro Co., A-H Super P.
      b. The Euclid Chemical Co., Melment L10A Super.
      c. Master Builders, Inc., Rheobuild 1000.
      d. Sika Corp., Sikament 300.
   2. Characteristics: Meeting ASTM C494, Type F; free of chloride ions.

E. Water: Clean and potable.

2.02 PROPORTIONS

A. Proportion in accord with ASTM C476, except where more stringent requirements are specified herein.

B. Fine grout: Use for grouting where void to be filled has a minimum dimension of 2" or less. Proportion materials by volume to provide minimum 2500 psi compressive strength at 28 days in accord with ASTM C1019.

C. Coarse grout: Use for grouting where void to be filled has a dimension greater than 2". Proportion materials by volume to provide minimum 2500 psi compressive strength at 28 days in accord with ASTM C1019.

D. Provide superplasticizer in all cement grout mixes..

2.03 GROUT MIXING

A. Mix grout in accordance with ASTM C 94/C 94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C 476 for fine and coarse grout.

C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

2.04 PRECONSTRUCTION TESTING

A. Testing will be conducted by an independent test agency, in accordance with provisions of Division 01.

B. Grout Mixes: Test grout batches in accordance with ASTM C 1019 procedures.
   1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.01 PREPARATION

A. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Work grout into masonry cores and cavities to eliminate voids.

B. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.

C. Do not displace reinforcement while placing grout.

D. Remove excess mortar from grout spaces.

E. Discard grout not placed within 1-1/2 hours after water is added to mix, or sooner if grout begins to set.

3.03 GROUTING

A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.

B. Place grout as directed in Section 042200 - Concrete Unit Masonry.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field tests, in accordance with provisions of Division 01.

B. Test and evaluate grout in accordance with ASTM C 1019 procedures.
   1. Test with same frequency as specified for masonry units.

C. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, cement grout for reinforced masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

END OF SECTION

SECTION 04 0090
MASONRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Laminated metal flashings and counterflashings.

B. Self-adhering composite flexible flashing.

C. Miscellaneous accessories.

1.02 RELATED SECTIONS

A. Section 033000 - Cast-In-Place Concrete.

B. Section 040070 - Cement Grout for Reinforced Masonry.

C. Section 040511 - Masonry Mortaring and Grouting.

D. Section 042200 - Concrete Unit Masonry.

E. Section 079005 - Joint Sealers: Backing rod and sealant at control joints.

F. Section 081113 - Hollow Metal Doors and Frames: Masonry anchors.

1.03 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets showing product characteristics and including installation instructions.

C. Shop Drawings: Show fabrication and installation details for the following:
   1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
   2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

D. Samples for Verification:
   1. Weep holes/vents in color to match mortar color.
   2. Accessories embedded in the masonry.

E. Mill tests:
   1. Submit for each heat of reinforcing steel, certifying mill tests conducted in accord with ASTM requirements.
   2. Cost for test shall be borne by Contractor.
   3. Unidentified bundles may be rejected or tested at the request of Gardner Spencer Smith Tench and Jarbeau, PC. Cost of test on unidentified bundles shall be borne by Contractor
   4. Submit three copies of each test report to Gardner Spencer Smith Tench and Jarbeau, PC

F. Manufacturer's Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
   1. Each type and size of joint reinforcement.
   2. Each type and size of anchor, tie, and metal accessory.

1.04 QUALITY ASSURANCE

A. Applicable standards; standards of the following as referenced herein:
   1. American Concrete Institute (ACI).
   2. American Society for Testing and Materials (ASTM).
   3. Steel structures Painting Council (SSPC).

B. Installer Qualifications: Company with at least five years of successful experience in weathertight installation of flashing.

C. Coordination: Interface flashing work with adjacent and adjoining work to ensure best possible weather resistance and durability of completed flashing.

1.05 MOCK-UP PANEL

A. Construct miscellaneous accessories as part of the brick mock-up panel. See Section 042100 - Brick Masonry for related items to be installed and coordinated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in manufacturer's sealed packaging, bearing manufacturer's name and product identification.

B. Stack flashing materials to avoid twisting, bending, and abrasion. Protect materials from weather before installation.

C. Store mastics, cements, and joint sealers in manufacturer's sealed containers under cover.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 PRODUCTS

2.01 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

2.02 MASONRY JOINT REINFORCEMENT

A. Acceptable Manufacturers; subject to compliance with specified requirements:
   1. Basis of design: Dur-O-Wal, Inc.
   2. Hohmann & Barnard, Inc.
   3. Wire-Bond.
   4. National Wire Products Industries, Inc.

B. Masonry joint reinforcement:
   1. Types:
      a. At single wythe masonry: Basis of design is Dur-O-Wall, DA 3100; Truss type.
      b. At double wythe masonry: Basis of design is Dur-O-Wal, Dur-O-Eye D/A 3700; Truss type with adjustable pintle ties; ties and cross wires spaced at 1'-4" o.c.
   2. Fabricate from cold-drawn wire meeting ASTM A82-95a.
   3. Longitudinal rods: Nine ga. galvanized deformed rods.
   4. Cross rods: Nine ga. galvanized rods, welded to longitudinal rods.
   5. Width of reinforcement shall be 2" less than the total wall width.
   6. Provide reinforcement in minimum 10'-0" lengths with prefabricated corners and tees at intersecting walls of same design, finish and joint reinforcement.
   7. Finishes:
      a. Reinforcement fully embedded in mortar at single wythe interior construction: Galvanized, meeting ASTM A641, Class 3 or A.
      b. Reinforcement fully embedded in mortar at single and double wythe exterior masonry: Hot-dipped galvanized, meeting ASTM A153, Class B-2.

2.03 ANCHORS FOR CONNECTING TO CONCRETE

A. Dovetail anchor characteristics:
   1. Material: Minimum 16 ga. hot-dipped galvanized steel, meeting ASTM A153, Class B-2.
   2. Type: Minimum 1" wide, corrugated type.
   3. Wall tie: Minimum 3/16" diameter hot-dipped galvanized steel, sized to extend to within 1" of exposed veneer face, meeting ASTM A153, Class B-3.

B. Dovetail slot characteristics:
   1. Material: Minimum 22 ga. galvanized steel.
   2. Size: 1: wide back by 1" deep with 5/8" throat.

2.04 MASONARY VENEER ANCHOR SYSTEM

A. Acceptable products; subject to compliance with specified characteristics:
   1. Basis of design: Dur-O-Wal, Inc., D/A 213 Assembly with anchor plate and pintle tie.
   2. Heckmann Building Products, Inc., No. 213 Wire Veneer Anchor System with No. 282 Double Pintle Wire Tie.
   3. Wire-Bond, RJ-711 Adjustable Veneer Anchor.

B. Characteristics:
   1. Description: Two-component tie assembly consisting of screw-attached back-up plate en capturing a wire tie.
   2. Back-up plate: Minimum 16 ga. grooved or punched plate assembly or minimum 14 ga. stiffened strap/plate assembly, punched for attachment to metal stud framing with two screws.
   3. Wire tie: Minimum 3/16" wire tie.
   4. Tie assembly: Size tie assembly to extend within 1" of exterior exposed face.
   5. Finish: Hot-dipped galvanized, meeting ASTM A153, Class B-3.
   6. Fasteners: Self-tapping steel screws, corrosive-resistant coated; passing Kesternich test chamber, DIN 50018 standard with no indications of red rust or corrosion after minimum 30 wet and dry acidic atmosphere cycles and minimum 1000 hours salt spray testing in accord with ASTM B117.

2.05 MASONRY PLUMBING CHASE WALL TIES

A. Material: Minimum 3/16" diameter hot-dipped galvanized steel wire meeting ASTM A82-95a. Coating shall comply with ASTM A153, Class B-1.

B. Size and configuration: "Z" type with 3" long 90 degree bends each end. Fabricate lengths 2" less than with of chase.

2.06 WELDED COLUMN AND BEAM ANCHOR SYSTEM

A. Acceptable products; subject to compliance with specified requirements:
   1. Heckmann Building Products Inc., 317 Anchor rod with 318 Series trapezoidal ties.
   2. Hohmann & Barnard, Inc., 359c Anchor rod with 301W Column Web Tie.
   3. Wirebond: Type 1-1000c with #1200 trapezoidal tie.

B. Column Characteristics:
   1. Type: Continuous weld-on rod type.
   2. Rod material: 1/4" diameter galvanized steel.
   3. Rod size and configuration: Continuous lengths as required with offsets 8" o.c.. Provide extended offsets at fireproofing conditions.
   4. Tie: Minimum 3/16" diameter steel wire, trapezoidal web shaped, sized to extend to within 1" of exposed veneer face.
   5. Finish: Hot-dipped galvanized, in accord with ASTM A153, Class B-3.

C. Beam Characteristics:
   1. Type: Two component, adjustable clip and tie assembly.
   2. Clip: Minimum 14 ga., 1" high x 1-1/4 wide steel strap with 3/16" offset for anchor, for welding onto steel. Provide extended offsets at fireproofing conditions.
   3. Corrugated Tie: Minimum 14 ga., 3/4" wide with 4" adjustment bend sized to extend to within 1" of exposed veneer face.
   4. Finish: Hot-dipped galvanized, in accord with ASTM A153, Class B-3.

2.07 "Z" ANCHORS FOR CORNER CONDITIONS AND PLUMBING CHASES

A. Type: Minimum size shall be 1/4" by 1-1/2" by 2'-0" including 2" long 90 degree bends at each end to form a "Z" shape.

B. Finish: Hot-dipped galvanized, in accord with ASTM A153, Class B-1.

2.08 BAR REINFORCEMENT

A. Bars: Meeting ASTM A615-96a, ACI 530-92 and ACI 530.1-92, deformed type for #3 and larger bars.
   1. Ties and stirrups: Grade 40, unless otherwise indicated on the drawings.
   2. All other bars: Grade 60, unless otherwise indicated on the drawings.

2.09 VERTICAL REINFORCING BAR POSITIONERS

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., D/A 811.
   2. Heckmann Building Products Inc., 377.
   3. Wire-Bond: 3401.

B. Type: Minimum 9 ga. wire, spider shaped positioner allowing rebar to be placed at center of wall or on either side of cavity. Finish shall be hot-dipped galvanized, in accord with ASTM A153, Class B-3.

2.10 HORIZONTAL REINFORCING BAR POSITIONERS

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., D/A 812.
   2. Heckmann Building Products Inc., 379.
   3. Wire-Bond, 3420.

B. Type: Minimum 9 ga. wire, spider shaped positioner allowing rebar to be placed at center of wall or on either side of cavity. Finish shall be hot-dipped galvanized, in accord with ASTM A153, Class B-3.

2.11 PRESSURE RELIEVING PADS

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., Rapid Soft-Joint, D/A 2010.
   2. Hohmann & Barnard, Inc., #NS.
   3. Wire-Bond: Horizontal/Vertical Expansion Joint.

B. Type: Self-adhering, closed cell neoprene conforming to ASTM D1056-97a, Class RE41, for compression up to 35%.

C. Sizes:
   1. Horizontal joints: 2-3/4" wide, 1/4" thickness.
   2. Vertical joints: 3" wide, 3/8" thickness.

2.12 CONTROL JOINT STABILIZATION ANCHORS

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., Joint Stabilization Anchors D/A 2200.
   2. Hohmann & Barnard, Inc., Slip-set stabilizer.
   3. Wire-Bond, #1700 Control Joint Anchors.

B. Type: Mill Galvanized Steel.

2.13 RUBBER CONTROL JOINTS

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., Rapid Control Joint.
   2. Hohmann & Barnard, Inc., RS Series, Rubber Control Joint..
   3. Wire-Bond, Control Joint 2900 Series.

B. Type: Extruded rubber meeting ASTM D2000, Type 2AA, 805, minimum 80 durometer hardness.

2.14 WIRE MESH HARDWARE CLOTH

A. Type: 1/2" by 16 ga. galvanized steel mesh, 2" less than wall width by 1'-4" long minimum.

2.15 FLASHING MATERIALS

A. Metal Flashing: Subject to compliance with requirements, provide one of the following for the condition specified:
   1. Acceptable manufacturers:
      a. Cheney Flashing Company, Inc; Product - Dovetail; www.cheneyflashing.com.
      b. Cheney Flashing Company, Inc; Product - Sawtooth: www.cheneyflashing.com.
      c. Keystone Flashing Co; Product - Two-Piece Cap Flashing; www.keystoneflashing.com.
      d. Keystone Flashing Co; Product - 3-Way Interlocking Thruwall Flashing; www.keystoneflashing.com.
      e. LITSCO; Product - LIT-Loc Two-Piece Cap Flashing; www.litsco.com.
      f. LITSCO; Product - Mortar-Tight Thru-wall Metal Flashing; www.litsco.com.
   2. Fabricate metal drip edges from sheet metal indicated. Extend at least 3 inches (75 mm) into wall and 1/2 inch (13 mm) out from wall, with hemmed outer edge bent down 30 degrees.

B. Metal Reglet System: Subject to compliance with requirements, provide one of the following for the condition specified:
   1. Acceptable products; generally in accord with the following:
      a. Fry Reglet Corp., Springlok, Type MA-4 at masonry walls, Type SM at other locations.
      b. W.P. Hickman, Masonry Type at masonry walls, Surface-Mounted Type at other locations.
      c. MM Systems Corp., RC-3 Masonry at masonry walls, RC-1 Surface-Mounted at other locations.
   2. Characteristics:
      a. Material: Stainless steel reglet and counterflashing, minimum 0.020" thickness.
      b. Finish: No further finish required.
      c. Accessories: Prefabricated interior and exterior corners and splice plates.

C. Concealed Flashing: For flashing partly exposed to exterior, use metal flashing specified above. For flashing not exposed to exterior, use the following unless otherwise indicated:
   1. Copper-Fabric flashing for areas with masonry and concrete backup:
      a. Acceptable manufacturers:
         1) Advanced Building Products, Inc.
         2) Afco Products, Inc.
         3) Hohmann & Barnard, Inc.
         4) Polytite Manufacturing Corp.
         5) Sandell Manufacturing Co., Inc.
         6) York Manufacturing, Inc.
      b. Characteristics:
         1) Type: Asphalt-bonded fabric-covered copper.
         2) Copper weight: Minimum 5.0 oz./sq. ft.
         3) Construction: Copper sheet bonded to asphalt-saturated fiberglass fabric, both sides.
      c. Drip edge plate: Continuous stainless steel plate with a smooth, factory-formed hemmed edge for installation safety and uniform appearance.
      d. Lap and bonding adhesives: Flashing manufacturer's adhesives recommended for use with flashing materials.
      e. Flashing cement: Meeting ASTM D2822-91, Type 1.

D. Flexible Membrane flashing across all control joints, steel columns or steel beams inside a concrete masonry unit wall with or without sheathing backup:
   1. Acceptable products, subject to compliance with specified requirements:

a. As specified in Section 07 6500 - Flexible Flashing.

2. Characteristics:
   a. Type: Adhesive-backed rubberized asphalt compound, bonded to 8 mil, high density, cross-laminated polyethylene film. Adhesive side coated with release paper.
   b. Membrane thickness: Minimum 40 mils.
   c. Surface conditioner/primer and mastic/sealant: Membrane manufacturer's solvent-based standard components.
3. Termination bar for flexible membrane flashing with or without sheathing backup: Minimum Stainless Steel 1/8" thick 1-1/2" wide continuous with holes 8" on center.
   a. Termination Mastic:
      1) Description: Rubberized asphalt-based mastic with 200 g/L max. VOC Content.
      2) Apply a bead or trowel coat of mastic along flashing vertical and horizontal edges, seams, cuts, and penetrations.

2.16 DRIP EDGE FLASHING

A. Acceptable products; subject to compliance with specified requirements:
   1. Dur-O-Wal, Inc., Drip Edge Flashing D/A 1525.
   2. Hohmann & Barnard, Inc., DP Series, Drip Plates.
   3. Wire-Bond, #4165 Drip Edge Flashing.

B. Type: Minimum Stainless Steel 26 ga. 1-1/2" wide continuous with 3/8" closed hem edge. Use at all through wall flashing locations.

2.17 WEEP/CAVITY VENTS

A. Acceptable Manufacturers; subject to compliance with specified requirements:
   1. Dur-O-Wal; Product Cell-Vent D/A 1006: www.dur-o-wal.com.
   2. Hohmann & Barnard, Inc; Product QV - Quadro-Vent: www.h-b.com.
   3. Wire-Bond; Product Cell Vent: www.wirebond.com.
   4. Substitutions: See Division 01 - Product Requirements.

2.18 CAVITY MORTAR DIVERTER

A. Cavity Mortar Diverter: Semi-rigid polyethylene or polyester mesh blocks, sized to fill bottom of wall cavity and suspend mortar droppings above weep/cavity vents to allow cavity drainage.
   1. Match air space thickness.

B. Acceptable Manufacturers; subject to compliance with specified requirements:
   1. CavClear; Product Masonry Mat: www.cavclear.com.
   2. Dur-O-Wal; Product Mortar Net D/A 1008: www.dur-o-wal.com.
   3. Hohmann & Barnard, Inc; Product Mortar Net: www.h-b.com.
   4. Wire-Bond; Product Mortar Net: www.wirebond.com.
   5. Mortar Net USA, Ltd; Product Mortar Net: www.mortarnet.com.
   6. Polytite Manufacturing Corp; Product Mortar Stop: www.polytite.com.
   7. Substitutions: See Section 01600 - Product Requirements.

2.19 CAVITY-WALL INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV or X, closed-cell product extruded with an integral skin.

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.20 GALVANIZING COMPOUND

A. Cold galvanizing compound: Pre-mixed, organic zinc liquid or spray containing 95% zinc in dried film; Brite Products, Brite Zinc or similar of other manufacturers.

2.21 FABRICATION

A. Forming: Fabricate flashings true to shape and accurate in dimension. Form pieces in longest possible lengths to minimize joints. Fold flashing at corners and at ends of pans instead of

cutting.

B. Joints: Provide not less than 4 inches of overlap at flashing joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to receive masonry accessories are thoroughly dry, free from loose materials, and reasonably smooth, with no sharp edges or projections.

B. Verify that locations to receive flashing are sloped so water that enters will drain to building exterior.

3.02 MASONRY JOINT REIFORCEMENT INSTALLATION

A. General:
   1. Install reinforcement and accessories in accord with manufacturer's product data. Provide sizes and methods of attachment as required by installation conditions. In addition to installation spacings specified, provide specified reinforcement and accessories at perimeter of windows, doors and other openings.
   2. Where galvanized components must be field-welded to supports, remove galvanizing prior to welding.

B. Install masonry joint reinforcement in all masonry walls at 1'-4" o.c. vertically. Lap side rods 6" minimum at splices' greater as required by product data.
   1. Stop reinforcement 1" back from expansion and control joints and openings in masonry walls.
   2. Install reinforcement in first and second bed joint above and under openings, with non-continuous reinforcement extending 2'-0" beyond jamb, each side.
   3. Install ladder type joint reinforcement with cross wires aligned with head joints of concrete masonry units.
   4. At splices, cross rods may be removed to facilitate placement.

C. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.
   1. Provide continuity with masonry joint reinforcement at corners by using prefabricated "L" units as well as masonry bonding.

D. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide continuity with masonry joint reinforcement by using prefabricated "T" units.

3.03 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

B. Coat cavity face of backup wythe to comply with Section 071500 - Dampproofing.

C. Installing Insulation: Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
   1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.04 ANCHORS FOR CONNECTING TO CONCRETE

A. Install dovetail anchor slots vertically in cast-in-place concrete surfaces 1'-4" o.c., maximum horizontally, adjacent to masonry walls. Install dovetail anchors at 1'-4" o.c., maximum, vertically.

3.05 MASONRY VENEER ANCHOR SYSTEM INSTALLATION

A. Attach masonry veneer anchor plates through sheathing to studs using specified fasteners.
   1. Install two fasteners per anchor plate assembly.
   2. Space anchor plates at 1'-4" o.c., each direction.
   3. Install one tie per plate, using specified fasteners.
   4. Additional ties shall be installed at 8" o.c. at jambs and near edges.

3.06 MASONRY PLUMBING WALL CHASE INSTALLATION

A. Install "Z" type galvanized steel plumbing chase wall ties with 90 degree bends embedded in each wythe of masonry chase walls in full bed of mortar. Space ties at 2'-0" o.c., vertically and 4'-0" o.c., horizontally.

3.07 WELDED COLUMN AND BEAM ANCHOR SYSTEM

A. Weld column anchors 2'-8" o.c. on flange of steel columns. Weld beam anchors 4'-0" o.c. at beams running adjacent to masonry. Attach ties and set in mortar bed.

3.08 "Z" ANCHORS FOR CORNER CONDITIONS

A. Install "Z" anchors at corners of intersecting walls at maximum 4'-0" o.c., vertically.

3.09 BAR REINFORCEMENT INSTALLATION

A. Bar reinforcement:
   1. Shop fabricate reinforcement to shape and dimensions indicated on approved shop drawings. Bent bars shall be bent cold. Fabricate in accord with ACI 315-92 and ACI 318-92.
   2. Reinforcement shall, at the time of placing, be free from rust scale, oil and other coatings reducing bond. Use no bar with kinks or bends not shown on shop drawings.
   3. Install reinforcement as specified in Section 042200 - Concrete Unit Masonry.

3.10 VERTICAL REINFORCING BAR POSITIONERS

A. Install vertical reinforcing bar positioners in reinforced masonry walls as specified in Section 042200 - Concrete Unit Masonry.

3.11 PRESSURE RELIEVING PADS INSTALLATION

A. Install vertical and horizontal pressure relieving pads in masonry construction at locations indicated.
   1. Joint sizes shall match masonry joint widths.
   2. Keep joints clean of masonry droppings.
   3. Install pressure relieving pads with lengths butted.
   4. Install horizontal pressure relieving pads under shelf angles.
   5. Caulk joints using sealant as specified in Section 079005 - Joint Sealers. Joints shall be watertight and free from voids after caulking.

3.12 CONTROL JOINT STABILIZATION ANCHORS

A. Install control joint stabilization anchors as specified in Section 042200 - Concrete Unit Masonry. Location of control stabilization anchors in unit masonry construction shall be indicated on the drawings.

3.13 RUBBER CONTROL JOINT INSTALLATION

A. Install rubber control joints as specified in Section 042200 - Concrete Unit Masonry. Location of control joints in masonry construction shall be indicated on the drawings.

3.14 WIRE MESH CLOTH INSTALLATION

A. Install wire mesh hardware cloth at concrete masonry units to prevent migration of grout from masonry units, where units are indicated to be grouted.

3.15 FLASHING INSTALLATION

A. General: Comply with recommendations of SMACNA ASMM.

B. Metal Flashing:
   1. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
      a. Clean surface of masonry smooth and free from projections which might puncture flashing material.
      b. Extend flashings full width at such interruptions and at least 6 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
      c. Remove or cover protrusions or sharp edges that could puncture flashings.
      d. Seal lapped ends and penetrations of flashing before covering with mortar.
      e. Extend laminated flashings to within 1/4 inch of exterior face of masonry.
      f. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.
      g. Place flashings on sloped mortar bed; seal lapped ends and penetrations of flashing before covering with mortar.
         1) Extend metal flashings through exterior face of masonry and turn down to form drip.
      h. Veneer Flashings: Turn flashings up not less than 4 inches at backup. Lap top of flashing with building paper, or otherwise seal to prevent moisture penetration between flashing and backup.
      i. Heads and Sills: Turn up ends of flashing at least 2 inches at heads and sills to form a pan, and seal joints.
      j. Sealing: Seal all joints in flashing to ensure watertight integrity.
         1) Lap end joints on non deformed metal flashings at least 4 inches; seal laps with elastic sealant or mastic.
   2. Metal Reglet Flashing:
      a. Install reglets as directed by manufacturer, level and true to line. Verify that through-wall flashing occurs at or above reglet locations.
         1) Surface-mounted reglets: Install reglets as walls are built.
         2) Masonry reglets: Install reglets as walls are built.
         3) Install with top of reglet minimum of 8" above adjacent roof.
      b. Terminate reglet 2" from each side of expansion and control joints in substrates to which surface-applied reglets are installed. Provide 1'-0" wide cover plate of reglet material, overlapping adjacent reglet lengths 4". Attach cover plates to provide discontinuous joints.
      c. Provide factory-fabricated corners at changes in directions.
      d. Following installation of roofing, install counterflashing by snapping into reglet in accord with manufacturer's product data. Overlap adjacent lengths 6", minimum, to allow for expansion and contraction. Caulk top edge of reglet using exterior silicone sealant as specified in Joint Sealers section. Ensure that through-wall flashing joints and weeps terminate in joints just above top edge of reglets.
   3. Flexible Membrane:
      a. Install as directed by manufacturer, level and true to line. Provide Flexible Membrane flashing across all steel columns or steel beams inside a concrete masonry unit wall with or without sheathing backup whether or not specifically indicated.
      b. Terminate membrane 4" minimum on each side of masonry substrates. Overlap adjacent lengths 6" over each subsequent lower membrane for a water-tight system.
      c. Provide termination bars for edges of membrane flashing terminating on concrete masonry unit faces. Minimum Stainless Steel 1/8" thick 1-1/2" wide continuous with holes 8" on center. Provide termination bars predrilled at spacing to match spacing of

cold formed metal framing.

d. Apply a bead or trowel coat of mastic along flashing vertical and horizontal edges, seams, cuts, and penetrations.
e. Provide a full bed of sealant at outside edge of flexible flashing and termination bars. See Section 079005 - Joint Sealers.

3.16 DRIP EDGE FLASHING

A. Drip Edge Flashing: Use at all through wall flashing locations.

3.17 WEEP/CAVITY VENTS INSTALLATION

A. Weephole Vents:
   1. Provide weephole ventilators in exterior wythe of masonry at 2'-0" o.c. horizontally at heads and sills of openings, in walls at grade, at top and bottom of relief angles, at top of parapet and in other locations where flashing is indicated.
   2. Weephole ventilators:
      a. Provide weephole ventilators at grade level.
      b. Install weephole ventilators in open head joint and sill of openings, flush with low edge of adjacent brick.
      c. Install weephole ventilators at relief angles and at parapets alternating 2'-0" o.c. with weephole ventilators at bottom of relief and and at grade.
   3. Keep weepholes and area above flashing free of mortar droppings.

3.18 CAVITY MORTAR DIVERTER INSTALLATION

A. Cavity Mortar Diverter: After first one or two courses of masonry are laid, place continuous row of cavity mortar diverter in cavity on flashing against inside of outer wythe at the base of the wall. Assure that cavity wall drainage system is continuous by overlapping or butting ends.

B. Provide cavity mortar diverters in exterior wythe of masonry wall cavity above weep/cavity vents to allow cavity drainage.

3.19 REPAIR GALVANIZED SURFACES

A. After installation, clean surfaces from which galvanizing was removed during installation in accord with SSPC-SP3_1983, "Power Tool Cleaning." Coat surfaces with cold galvanizing compound, 3.0 mils minimum dry film thickness.

3.20 ADJUSTING

A. Remove mortar or other obstructions from weep holes at flashing locations.

END OF SECTION

SECTION 04 0511
MORTAR AND MASONRY GROUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar for masonry.

B. Grout for masonry.

1.02 RELATED REQUIREMENTS

A. Section 040070 - Cement Grout for Reinforced Masonry.

B. Section 040090 - Masonry Accessories.

C. Section 042200 - Concrete Unit Masonry: Installation of mortar and grout.

D. Section 08 1113 - Hollow Metal Doors and Frames: Products and execution for grouting steel door frames installed in masonry.

1.03 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.

B. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International; 2008.

C. ASTM C5 - Standard Specification for Quicklime for Structural Purposes 2010.

D. ASTM C91/C91M - Standard Specification for Masonry Cement 2012.

E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2015.

F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2011.

G. ASTM C150/C150M - Standard Specification for Portland Cement 2016.

H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2006 (Reapproved 2011).

I. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2014a.

J. ASTM C476 - Standard Specification for Grout for Masonry 2016.

K. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2016a.

L. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.

M. ASTM C1019 - Standard Test Method for Sampling and Testing Grout 2016.

N. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength 2013.

O. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry 1995 (Reapproved 2013).

P. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

Q. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Include design mix and indicate whether the Proportion or Property specification of {\rs\#1} is to be used. Also include required environmental conditions and admixture limitations.

C. Samples for Verification: Submit five samples of mortar, illustrating mortar color and color range.
   1. Submit actual mortar samples for colored mortar, 3/8" wide by 8" long, indicating color range of each color selected. Samples shall be made using cement brand and type, proportions and sand source proposed for work on this project. Label Samples to indicate types and amounts of pigments and sand used.

D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.

E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of {\rs\#1} and test and evaluation reports to requirements of ASTM C1019.

F. Manufacturer's Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
   1. Each cement product required for mortar and grout, including name of manufacturer, brand type, and weight slips at time of delivery.

G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Comply with provisions of {\rs\#1}, except where exceeded by requirements of Contract Documents.

B. For each type and color of cement specified, only one brand shall be used throughout project.

C. Portland Cement: Obtain sample and test in accordance with ASTM C 150.

D. Mortar: Obtain sample and test in accordance with ASTM C 780.

E. Grout: Obtain sample and test in accordance with ASTM C 404.

F. Compressive Tests: Obtain sample and test to verify compliance with the following minimum values:
   1. Mortar: At least 900 psi at 7 days and 1,800 psi at 28 days.
   2. Grout: At least 1,200 psi at 7 days and 2,000 psi at 28 days.
   3. Do not test 28 day specimen when 7 day tests exceed 28 day requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

B. Deliver materials, except aggregate, in original unopened containers displaying product name, type, grade and mixing instructions.

1.07 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. Mortar Mix Designs: {\rs\#1}, Property Specification.

2.02 MATERIALS

A. Masonry Cement: ASTM C 91, Type S. Only one brand shall be used throughout the project.

B. Portland Cement: ASTM C 150, Type I - Normal; color as required to produce approved color sample. Only one brand shall be used throughout the project.

C. Hydrated Lime: {\rs\#1}, Type S.

D. Pre-mixed, colored masonry cement:
   1. Acceptable product's; pending compliance with specified characteristics and acceptable color range to match specified color:
      a. Citadel Cement, Div. Lafarge Corp., Citadel Custom Color Masonry Cement.
      b. Coplay Cement Co., Brixment-In-Color.
      c. Holnam, Inc., Rainbow Motarmix Masonry Cement.
      d. Leigh Portland Cement Co., Custom Color Masonry Cement.
      e. National Cement Co., Coosa Masonry Cement.
      f. Riverton Corp., Flamingo Masonry Cement.
      g. U.S. Cement Co., Custom Color Masonry Cement.
   2. Characteristics Type S: Meeting ASTM C91-97, Type S non-staining, 22% maximum air content by volume, with inert, alkali-resistant, fade-resistant mineral pigments and complete with water-reducing and plasticizing admixtures, proportioned to comply with requirements of ASTM C270-97 for Type S mortar with minimum 28-day compressive strength of 1800 psi for Type S mortar.
   3. Characteristics Type N: Meeting ASTM C91-97, Type N non-staining, 22% maximum air content by volume, with inert, alkali-resistant, fade-resistant mineral pigments and complete with water-reducing and plasticizing admixtures, proportioned to comply with requirements of ASTM C270-97 for Type N mortar with minimum 28-day compressive strength of 750 psi for Type N mortar.
   4. Colors: Basis of design: Match Existing.

E. Color Additives for Cast Stone Pointing Mortar: Natural or synthetic mineral oxides meet ASTM C979-97; sun-fast, lime-proof and alkali-resistant.
   1. Additive shall not exceed 10% of the weight of the cement used.
   2. Color shall be selected by Gardner Spencer Smith Tench and Jarbeau, PC to match existing.

F. Aggregate:
   1. For mortar: Clean, hard, natural washed sand meeting ASTM C144-93. Provide aggregate from single source for colored mortar.
   2. For cement grout: Refer to Section 040070 - Cement Grout for Reinforced Masonry.

G. Water-reducing and plasticizing admixture:
   1. Acceptable products:
      a. Anti-Hydro Co., Ahco WR.
      b. Chem-Masters Corp., Hydrolox 400.
      c. Sonneborn Building Products, Div. of ChemRex, Inc., Trimix NCA.
   2. Characteristics: Non-chloride admixture meeting ASTM C494-99a, Type E. Admixtures containing calcium chloride shall not be permitted.

H. Non-shrink grout:
   1. Acceptable products:
      a. Anti-Hydro, Axpandcrete-S Hi-Flow.
      b. Bostik Construction Products, Upcon Super Flow 263.
      c. The Burke Company, Non-Ferrous, Non-Shrink Grout.
      d. Lambert Corporation, Vibropruf #11.
      e. L&M Construction Chemicals Co., Crystex.
      f. Master Builders Co., Master Flow 713.
      g. Sonneborn Building Products, Sonogrout.
      h. U.S. Grout Corp., Five Star Grout.
      i. W.R. Bonsal Co., Type A Construction Grout.
      j. W.R. Meadows, Inc., 588
   2. Characteristics: Flowable, non-metallic, controlled expansive type grout.

I. Anchoring cement for railings:
   1. Acceptable products:
      a. BASF, MasterSeal 590.
      b. Damtite, Waterproofing Hydraulic Cement.
      c. Drylok Masonry Products, Fast Plug.
      d. Sakrete, Leak Stopper Hydraulic Cement.
      e. Quikrete, Hydraulic Cement.
   2. Characteristics: Quick-setting, self-leveling, pourable cement base; waterproof, non-shrinking hydraulic compound.

J. Mortar Aggregate: {\rs\#1}.

K. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with {\rs\#1}.

L. Water: Clean and potable, free from deleterious amounts of alkalis, acids and organic materials.

2.03 PROPORTIONS

A. Type S job-mixed or bag -mixed mortar: Proportion materials by volume in accord with ASTM C270-97, as follows:
   1. One part masonry cement to 1/2 part Portland cement to aggregate proportioned at not less than 2-1/4 nor more than three times the volumes of cements used, or;
   2. One part Portland cement and 1/4 to 1/2 part hydrated lime to aggregate proportioned at not less than 2-1/4 nor more than three times the combined volume of cement and lime used, or;
   3. One part pre-mixed Type S masonry cement to aggregate proportioned not less than 2-1/4 nor more than three times the volume of masonry cement used, and as directed by masonry cement manufacturer's product data to produce Type S mortar. This method is required for pre-mixed colored masonry cement.

B. Type N job-mixed or bag -mixed mortar: Proportion materials by volume in accord with ASTM C270-97, as follows:
   1. One part pre-mixed Type N masonry cement to aggregate proportioned at not less than 2-1/4 nor more than three times the volume of masonry cement used, and as directed by masonry cement manufacturer's product data to produce Type N mortar. This method is required for pre-mixed colored masonry cement.

C. For cement grout: Refer to Section 040070 - Cement Grout for Reinforced Masonry.

D. Non-shrink grout: Mix prepared non-shrink grout product with water as directed by manufacturer's product data to achieve a minimum compressive strength of 7000 psi at 28 days.

E. Anchoring cement for railings: Mix prepared anchoring cement product with water as directed by manufacturer's product data for immediate use.

2.04 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with {\rs\#1} and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Colored Mortar: Proportion selected pigments and other ingredients to match Gardner Spencer Smith Tench and Jarbeau, PC's sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.

D. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

E. Do not use anti-freeze compounds to lower the freezing point of mortar.

F. Measure materials for job mixed mortars in a one cubic foot container. Do not measure by shovels.

G. If water is lost by evaporation, re-temper only within two hours of mixing.

H. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.05 GROUT MIXES

A. Mortar: Dry, loose volumes. Mix proportions shall be verified by material testing laboratory.
   1. Portland cement: 1 part.
   2. Hydrated lime: 1/4 to 1/2 part.
   3. Mortar sand: 2-1/4 to 3 parts.
   4. Water: to provide required consistency.
   5. Mixing time for Silotec Mortar System shall be in accordance with Silotec Mortar System recommendations instead of those indicated in Section 01420: Testing and Inspection.

B. Grout: Shall provide a minimum strength of 2000 psi unless noted otherwise. Grout strengths in excess of more than 2000 psi shall be verified by a material testing laboratory.
   1. Fine Grout: Portland cement 1 part; sand 2 1/4 to 3 parts; water to attain a slump of 8 to 10 inches
   2. Coarse Grout: Portland cement 1 part; pea gravel 2 1/4 to 3 parts; water to attain a slump of 8 to 10 inches.

C. Measurements: Proportion by accurate volume measurements. Measure in calibrated devices that can be verified at any time.
   1. Add water for workable consistency.
   2. Shovel measurements are not permitted.

D. Mixing: Place sand, cement, and water in mixer in that order, while mixer is running; mix for 3 minutes, add lime, and admixture (for grout), and continue mixing until a uniform mass is provided, but in no case less than 10 minutes.
   1. Equipment for mixing and handling mortar and grout shall be acceptable to the owner's testing consultant.
   2. Batches of less than one sack of cement, and fractional sack batches are not permitted.

E. Re-tempering Time Limit: Re-temper on mortar boards, for at least 3 minutes, but not more than 10 minutes when required, by adding water into a basin formed by mortar, and installing mortar into it. Dashing, or pouring of water over mortar is not permitted.
   1. Do not re-temper mortar which has become hard or non-plastic.
   2. Discard mortar, which has not been installed within one hour after original mixing.

F. Ready-Mix Grout: Grout batched off the Project site and delivered by mixer truck shall be subject to same procedures and controls as prescribed by building code requirements. Refer to Division 01: Testing and Inspection.

2.06 PRECONSTRUCTION TESTING

A. Testing will be conducted by an independent test agency, in accordance with provisions of Division 01.

B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
   1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.

C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
   1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.01 PREPARATION

A. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.

D. Do not displace reinforcement while placing grout.

E. Remove excess mortar from grout spaces.

F. Discard grout not placed within 1-1/2 hours after water is added to mix, or sooner as indicated by grout manufacturer.

3.03 PLACING MORTAR

A. Place mortar as directed in the 042100 - Brick Masonry, {\ch\#2} and {\ch\#3} Sections.

3.04 PLACING GROUT

A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of Contract Documents.

B. Perform grouting by means of high-lift technique, except in locations that mandate use of low-lift grouting technique.
   1. Do not use high-lift grouting where size of cavities mandates use of fine grout.

C. Steel Door Frames:
   1. Locate door frames accurately, install plumb, "Ram-set" or "Rawlplug" to floor surface and brace in position before start of masonry installation.
      a. Frames are specified to be furnished with adjustable anchors.
      b. Fill interior of frames solid with mortar or grout as walls are constructed.
   2. Provide temporary wood spreaders from jamb to jamb and from head to floor to ensure that jambs do not bow-in, distort from a straight line, or deflect from superimposed loads during construction.

D. Low-Lift Grouting:
   1. Limit height of pours to 24 inches.
   2. Limit height of masonry to 16 inches above each pour.
   3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
   4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
   5. Grouted walls shall be solid and without voids.
   6. Grout may be installed by pump, tremie or bucket, using hoppers to avoid spilling on exposed surfaces.
   7. Place an initial 2 feet high lift around, thoroughly compact, then place balance of each lift, compacting again through total lift, with hardwood spading sticks or pencil vibrators.
   8. Stop grout pours 1-1/2 inches below top of each lift.
   9. Remove and discard spilled grout from upper units before grout can harden.
   10. Bracing: Adequately brace walls against wind and other forces during and after construction.
   11. Re-puddle top of grout after initial set.

E. High-Lift Grouting:

1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
2. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
3. Place grout for spanning elements in single, continuous pour.
4. High-lift grouting method is permitted provided following qualifications and requirements are met. High-lift grouting shall apply only to cell sizes available with 8 inch and wider block units. This method is subject to specific approval of Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office.
5. Provide bond beam units, inverted for start course, and omit alternate blocks or cut openings in alternate face shell on bottom course for cleanouts.
6. Remove projecting mortar fins. Wash out every cell thoroughly using a water jet, which has sufficient force to remove mortar from the interior of the cells, and from reinforcing steel.
7. Plug each cleanout by setting a "soap" in mortar into opening and securely bracing it in place to prevent displacement. If masonry is not exposed in finish Work, cleanouts may be formed.
8. Grouting:
    a. Grout masonry cells solid, free from voids.
    b. Do not install grout until masonry has set a minimum of 3 days in warm weather (50 degrees to 85 degrees F.) or 5 days in cool, damp weather (35 degrees to 50 degrees F.).
    c. Pump grout into grout cell space as rapidly as practical. Discard grout not in place within one hour after water was first added to batch.
    d. Install grout with maximum slump without segregation. Place in a continuous pour, in maximum lifts of 4 feet, with approximately 20 minutes elapsed time between any 2 successive lifts.
9. Consolidating:
    a. Consolidate and reconsolidate grout using 3/4 inch lightweight flexible cable vibrators.
    b. First consolidation shall be performed to bottom of lift immediately after placement, and in case of subsequent lifts, through previously placed lift.
    c. Top lift shall be reconsolidated no sooner than 30 minutes after grout has been installed.
    d. Vibrating of reinforcing steel is not permitted.
10. Bracing: Adequately brace walls against wind and other forces during and after construction.

3.05 FIELD QUALITY CONTROL

A. An independent testing agency will perform field tests, in accordance with provisions of Division 01.

B. Test and evaluate mortar in accordance with {\rs\#1} procedures.
    1. Test with same frequency as specified for masonry units.

C. Test and evaluate grout in accordance with {\rs\#1} procedures.
    1. Test with same frequency as specified for masonry units.

D. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, mortar and masonry grout will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

3.06 SCHEDULES

A. Concrete Unit Masonry mortar shall be Type S.

B. Brick Masonry mortar shall be Type S, colored mortar.

C. Cast Stone mortar shall be Type N, colored mortar.

END OF SECTION

SECTION 04 2200
CONCRETE UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Work of this section includes providing concrete masonry units and building in the work of other trades.

1.02 SECTION INCLUDES

A. Concrete Masonry Units.

B. Concrete Brick.

C. Decorative Concrete Masonry Units.

D. Accessories.

1.03 RELATED SECTIONS

A. Section 03 2000 - Concrete Reinforcing: Reinforcing steel for grouted masonry.

B. Section 040070 - Cement Grout for Reinforced Masonry.

C. Section 040090 - Masonry Accessories.

D. Section 040511 - Masonry Mortaring and Grouting

E. Section 055000 - Metal Fabrications: Loose steel lintels.

F. Section 079005 - Joint Sealers: Backing rod and sealant at control joints.

G. Section 081113 - Hollow Metal Doors and Frames: Masonry anchors.

1.04 REFERENCES

A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 1995.

B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 1995.

C. ASTM C 55 - Standard Specification for Concrete Brick; 1996a.

D. ASTM C 90 - Standard Specification for Load-Bearing Concrete Masonry Units; 1996a.

E. ASTM C 91 - Standard Specification for Masonry Cement; 1995c.

F. ASTM C 129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 1996a.

G. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units; 1996b.

H. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

I. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

J. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

K. Portland Cement Association (PCA) - Concrete Masonry Handbook, latest edition.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units.

C. Samples for Verification: Submit two samples of concrete units to illustrate color, texture, and extremes of color range.

1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in completed construction.
2. Submit one sample of fire-resistant-rated bull nosed concrete masonry unit to illustrate color, texture.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

E. Manufacturer's Certificates:
1. Submit certificates from masonry manufacturer prior to delivery of concrete masonry units to project site. Each certificate shall be signed by an authorized officer of the manufacturing company and shall contain the name and address of the Contractor, the project location, and the quantities and date or dates of shipment or delivery to which the certificate applies.
2. Units shall be certified for compliance with specification requirements, including compressive strength, moisture content, and linear drying shrinkage.
3. Time-rated, fire resistant masonry units shall be certified by manufacturer to comply with mix design and equivalent thickness requirements of Underwriters' Laboratories, Inc (U.L.) for time ratings indicated. Certification shall include evidence of manufacturer's qualification to manufacture fire-rated units.

1.06 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
1. Source Control: Obtain exposed masonry units from one manufacturer, with texture and color uniform or of a uniform blend acceptable to the Architect.

B. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

C. Remove and replace masonry where appearance is unacceptable.

D. Concrete Masonry Units: Sample and test in accordance with ASTM C 140.
1. Notify the material testing laboratory a minimum of 45 days in advance of installing concrete unit masonry, to allow for testing of the units for compression, shrinkage, and absorption. Absorption test requires 40 days.
2. The material testing laboratory shall receive five concrete masonry units per test from masonry unit manufacturer, as designed or specified by Gardner Spencer Smith Tench and Jarbeau, PC, and shall perform and send required test results to Gardner Spencer Smith Tench and Jarbeau, PCand Union County Commissioner's Office's Owners Representative.

E. Inspection During Installation: A special inspector will continuously observe the installation of reinforced masonry. The Union County Commissioner's Office's OR shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.

F. The Union County Commissioner's Office will be responsible for the costs of original tests and inspection.

G. If core testing is required by Union County Commissioner's Office, masonry removed by coring operations shall be replaced to match adjoining Work. Core testing shall conform with SBC, Chapter 21.

1.07 MOCK-UP PANEL

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high, which includes mortar and accessories and structural backup.

B. Locate mock-up panel where directed by the Architect.

C. Mock-up may remain as part of the Work.

1.08 PRE-INSTALLATION MEETING

A. Convene 2 weeks before starting work of this section. Meeting shall be attended by Gardner Spencer Smith Tench and Jarbeau, PC, General Contractor, Subcontractor, and supervising mason.

B. Review all masonry detailing, project conditions, supervision of trades, coordination of related construction, and continuity of workmanship.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Keep units dry. Allow air circulation around stacked units. Wet concrete masonry units shall not be installed.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Lay no masonry units when temperature of surrounding air has dropped below 45 degrees F., unless it is rising, and at no time when it has dropped below 40 degrees F., unless authorized in writing by the Architect.

B. When masonry work is authorized at temperatures below 40 degree F., but above freezing, provide mortar at temperature between 70 degrees F. and 100 degrees F. Maintain air temperature above 40 degrees F. on both sides of masonry for 72 hours after laying.

C. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperatures of 95 degrees in the shade and 50% humidity.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.
   1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

1.11 JOB CONDITIONS

A. Protection of Work:
   1. Keep walls dry during erection by covering at end of each work period with a waterproof membrane. Protect partially completed walls not under construction in a similar manner. Covering shall overhang at least 2'-0" on each side of wall and shall be anchored on each side of wall.
   2. Protect finish exposed work from staining.
   3. Allow mortar droppings sticking to the unit face to dry, then remove with a trowel and lightly brush the wall surface with a bristled brush.
   4. Particular care shall be given to keeping masonry units clean in areas not to be painted.

B. Install and inspect mechanical and electrical work prior to enclosing or covering with masonry. Where runs of piping or conduit are required, cut away web of masonry unit without disturbing face or bond.

C. Coordinate installation of masonry anchors with structural system to which masonry is attached.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 4 inches (actual 15-5/8" by 3-5/8"), 16 x 8 inches (actual 15-5/8" by 7-5/8"), 16 x 12 inches (actual 15-5/8" by 11-5/8"), and nominal depths as indicated on the drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions, whether or not specifically indicated on the drawings as special.
   3. Outside Corners: Provide rounded or bull-nosed units.
   4. Units for use in reinforced masonry construction with exposed external corners, that cannot be provided with an integral bull-nosed unit shall be plain (square) end types with a 1" radius field-ground onto the exposed external corner to match the non-rated bull-nosed units where shown on the drawings.
   5. Fire Ratings: Provide fire rated units at locations where indicated on the drawings.
      a. Manufacture of time-rated, fire-resistant masonry units shall be qualified in writing by Underwriters Laboratories, Inc., (UL) for manufacture of fire-rated units. Exposed external corners shall be bullnose type. Provide two-hour UL-rated concrete masonry at one-hour rated concrete unit masonry assemblies indicated on drawings.
      b. Units for use rated masonry construction with exposed external corners, that cannot be provided with an integral bull-nosed unit shall be plain (square) end types with a 1" radius field-ground onto the exposed external corner to match the non-rated bull-nosed units. The cells of the unit with the field-ground external corner shall be filled with concrete.
   6. Load-Bearing Units: ASTM C 90, lightweight, Type II.
      a. Hollow block, as indicated.
      b. Exposed faces: Manufacturer's standard color and texture where indicated.
   7. Load-Bearing Units: ASTM C 145, lightweight, Type II.
      a. Solid block, as indicated.
      b. Exposed faces: Manufacturer's standard color and texture where indicated.
   8. Non-Loadbearing Units: ASTM C 129, lightweight, Type II.
      a. Hollow block, as indicated.
      b. Exposed faces: Manufacturer's standard color and texture where indicated.

B. Concrete Brick: ASTM C 55.
   1. Grade N, solid, lightweight.
   2. Size: As indicated on drawings.
   3. Special Shapes: Provide non-standard brick configured for corners and water table ledge.

C. Decorative Concrete Masonry Units (DCMU): ASTM C90-96.
   1. Description: Ground face masonry units are pre-finished integrally colored concrete block.
   2. Manufacturers:
      a. Basis of design: Trenwyth Industries; Product, Trendstone: www.trenwyth.com.
      b. County Materials Corporation; Product, Ultra Burnished: www.countymaterials.com.
      c. Domine Builders Supply; Product, Ground Face: www.domineblock.com.
      d. Johnson Concrete Co; Product, Prestige Stone: www.johnsoncmu.com.
      e. Westbrook Concrete Block Co., Inc; Product, Ground Face: www.westbrookblock.com.
   3. Color: Provide integrally colored concrete masonry units from manufacturer's standard colors as selected Gardner Spencer Smith Tench and Jarbeau, PC.
      a. Match Existing.
   4. Texture: Ground face smooth.

a. Match Existing.
5. Size: As indicated on drawings.
6. Mortar Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC.
7. Fire Ratings: Provide fire rated units at locations where indicated on the drawings.

D. Split Face Concrete Masonry Units (SFCMU): ASTM C-90.
1. Description: Integrally colored pre-finished architectural concrete blocks with, rough-hewn texture on one or more faces of the unit.
2. Manufacturers:
a. Basis of design: Trenwyth Industries; Product, Split-Face: www.trenwyth.com.
b. County Materials Corporation; Product, SplitFace: www.countymaterials.com.
c. Domine Builders Supply; Product, Split Face: www.domineblock.com.
d. Johnson Concrete Co; Product, Prestige Split Face: www.johnsoncmu.com.
e. Westbrook Concrete Block Co., Inc; Product, Split Face: www.westbrookblock.com.
3. Color: Provide integrally colored concrete masonry units from manufacturer's standard colors as selected Gardner Spencer Smith Tench and Jarbeau, PC.
a. Match Existing.
4. Texture: Manufacturer's standard rough-hewn texture where indicated.
a. Match Existing.
5. Size: As indicated on drawings.
6. Mortar Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC.
7. Fire Ratings: Provide fire rated units at locations where indicated on the drawings.

2.02 ACCESSORIES

A. Accessories: As specified in Section 040090 - Masonry Accessories.

2.03 MASONRY CLEANING COMPOUND

A. Masonry Cleaning Compound:
1. Acceptable Products:
a. Diedrich Technologies, Inc., Product: Architectural & Specialty Masonry Cleaner: www.diedrichtechnologies.com.
b. Dumond Chemicals, Product: Architectural Cleaner and Restorer: www.dumondchemicals.com.
c. ProSoCo, Inc., Product: Sure Klean #101 Lime Solvent and Sure Klean #600 Detergent: www.prosoco.com.
2. Product Requirements:
a. Compound shall be certified as acceptable by masonry manufacturer, meeting specified requirements, and as recommended by the compound manufacturer for selected masonry, to ensure that proposed masonry cleaning compound causes no staining or discoloration.
b. Products shall be specifically formulated for masonry type, color, and material content. Product data shall state whether particular compound is acceptable for dark-colored, light colored, masonry subject to non-metallic staining or masonry subject to metallic staining.
3. Test Panel: Test each type and dilution of cleaning compound on sample panel.
4. Formulation: Dilutable formula comprised of inorganic acids, wetting agents and inhibitors.
5. Characteristics:
a. Compound shall be able to cling to masonry for an average dwell period of two minutes, able to loosen mortar residue for complete removal, and shall be water-washable upon completion.
b. Compound shall not cause acid burns or streaks.
c. Compound shall be able to be applied, based on dilution amount, by using a soft masonry brush or low pressure (40psi-50psi) airless sprayer.

B. Pine Straw shall be free of trash and debris.

PART 3 EXECUTION

3.01 GENERAL

A. Layout: Lay out masonry for accurate pattern bond, for uniform joint widths, and for accurate location of specific features before beginning actual construction. Avoid use of masonry units of less than 1/2 size. Do not use units with less than nominal 4 inch horizontal face dimensions at corners and jambs.

B. Chases and Recesses: Build masonry to accommodate the work of other trades, including chases and recesses as shown or required. Provide not less than 8 inches of masonry between jambs of openings and chases and recesses.

C. Openings for Equipment and Services: Leave openings in masonry as required for subsequent installation of equipment and services. Make openings in designated locations and in exact size required, if known; otherwise, leave rough openings in approximate size required and complete masonry work after installation of equipment, matching adjoining masonry.

D. Workmanship: Install masonry plumb and true to line with straight level joints of uniform thickness. Maintain masonry clean during and after installation.
   1. Lay-out and incorporate embedded hardware items.
   2. Assist other trades with built-in items, which require cutting and fitting of masonry.
   3. Cut block units with a diamond saw or carborundum wheel. Trowel or chisel cutting is not permitted.
   4. Keep cavities clear of droppings and debris. Remove promptly.

E. Reinforcing Steel: Install as indicated on Drawings. Except as otherwise indicated, install reinforcement in accordance with standards of Concrete Reinforcing Steel Institute and to requirements specified. Do not splice vertical reinforcing except where indicated on the Drawings.

F. Shoring: Provide temporary shoring for lintels with sufficient strength to carry load without deflecting. Remove temporary shoring 28 days after masonry has been installed.

G. Structural Framing Anchorage: Anchor masonry to structural framework at points of adjacency, and as follows:
   1. Maintain open space of 1 inch or more between face of framing member and masonry elements.
   2. Fasten anchors to structure and embed in mortar joints as masonry is laid.
   3. Space anchors at maximum of 36 inches on center horizontally and 24 inches on center vertically.

H. Veneer Anchorage: Anchor masonry veneer to structural backup with anchors specified, and as follows:
   1. Fasten to backup with self -tapping , non corrosive fasteners as recommended by the manufacturer of anchors for substrate conditions.
   2. Space plates of two-piece anchors so they will be centered on horizontal movement of ties due to differential movement of veneer and backup.
   3. Embed tie sections of two-piece anchors in mortar as masonry is being laid, providing clear air space of at least 2 inches behind veneer wythe.
   4. Space anchors at not more than 1.77 square feet per anchor, nor more than 16 inches on center horizontally and vertically. At openings and ends of veneer panels, provide additional anchors so that maximum spacing at perimeter is 8 inches on center.

3.02 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.

2. Verify that field conditions are acceptable and are ready to receive masonry.
3. Verify that related items provided under other sections are properly sized and located.
4. Verify that reinforcing dowels are properly placed. Adjust projected vertical reinforcing dowels to be plumb in all directions prior to start of masonry work.
5. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before Installation, examine that built-in items are in proper location, and ready for roughing into masonry work.

3.03 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Bond: Match Existing.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

3.05 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surface and, where possible, cut edges concealed.

E. Install only quality units; reject all defective units. No broken, chipped or cracked units shall be used.

3.06 PLACING AND BONDING

A. Concrete Masonry Units: Do not wet concrete masonry units prior to laying.

B. Foundation preparation: Sandblast tops of concrete starting surfaces, wash-off by high pressure water jet, and slurry coat surfaces with neat cement grout for bond to masonry.

C. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

D. Lay hollow masonry units with face shell bedding on head and bed joints.
1. Install concrete masonry unit insulation in accordance with manufacturer's recommendations.

E. Install masonry with mortar to required joint thickness. Install blocks with 3/8-inch mortar bed on entire horizontal surface. Fill head joints solid, install tightly to adjoining units. Provide 3/8-inch joint thickness.
1. Hold racking to a minimum.

2. No toothing is permitted.
3. If it becomes necessary to move a unit after it has been installed, remove the unit, discard the mortar, and install the unit in fresh mortar.

F. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

G. Remove excess mortar as work progresses. Keep cavities clear of mortar droppings and strike flush mortar joints facing cavity.

H. Interlock intersections and external corners.

I. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

J. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

K. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

L. Isolate masonry partitions from vertical structural framing members with a control joint or as indicated.

M. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with sealant and backer rod.

N. Stopping Work: Lay masonry in proper sequence to avoid toothing. Rack walls back in each course at end of each work day. Before resuming, clean exposed surfaces and remove loose masonry units and mortar.
1. Lightly wet previously laid clay masonry units which have a rate of absorption of more than 1 gram per square inch per minute (ASTM C 67), before laying fresh masonry.

O. Lay concealed masonry with all units in wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

P. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

Q. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core. All built-in work shall be set plumb, level and square, to depth required for subsequent finish and trim applications.

R. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, post, and similar items, unless otherwise indicated.

S. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
1. Install compressible filler in joint between top of partition and underside of structure.
2. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

3.07 WEEPS

A. Install weeps in exterior veneer and cavity walls at 24 inches on center horizontally in head joint of first course of masonry immediately above through-wall flashing.

3.08 CAVITY WALL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.

B. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor barrier adhesive.

3.09 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. General: Before placing metal masonry accessories, remove loose rust, dirt, and other non-conforming coatings

B. Install horizontal joint reinforcement 8 inches on center.

C. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

D. Place continuous joint reinforcement in first and second joint below top of walls.

E. Lap joint reinforcement ends minimum 6 inches.

F. Reinforce joint corners and intersections with strap anchors 16 inches on center.

G. Do not span movement joints with reinforcement.

3.10 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY

A. General: Before placing metal masonry accessories, remove loose rust, dirt, and other non-conforming coatings

B. Install horizontal joint reinforcement 16 inches on center.

C. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of openings.

D. Place continuous joint reinforcement in first and second joint below top of walls.

E. Lap joint reinforcement ends minimum 6 inches.

F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 24 inches vertically.

G. Reinforce joint corners and intersections with strap anchors 16 inches on center.

3.11 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

C. Place flashings on sloped mortar bed; seal lapped ends and penetrations of flashing before covering with mortar.
   1. Extend metal flashings through exterior face of masonry and turn down to form drip.

D. Veneer Flashings: Turn flashings up not less than 4 inches at backup. Lap top of flashing with building paper, or otherwise seal to prevent moisture penetration between flashing and backup.

E. Heads and Sills: Turn up ends of flashing at least 2 inches at heads and sills to form a pan, and seal joints.

F. Sealing: Seal all joints in flashing to ensure watertight integrity.
   1. Lap end joints on nondeformed metal flashings at least 4 inches; seal laps with elastic sealant or mastic.

3.12 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Openings to 42 inches: Place two, No. 3 reinforcing bars 1 inch from bottom web.
   2. Openings from 42 inches to 78 inches: Place two, No. 5 reinforcing bars 1 inch from bottom web.
   3. Openings over 78 inches: Reinforce openings as detailed.
   4. Do not splice reinforcing bars.

5. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
6. Place and consolidate grout fill without displacing reinforcing.
7. Allow masonry lintels to attain specified strength before removing temporary supports.
8. Contractor's option: Install precast or prestressed lintels as specified and as recommended by the lintel manufacturer.

C. Maintain minimum 12 inch bearing on each side of opening.

3.13 GROUTED COMPONENTS

A. Grouting Technique: See Section 04065 for additional information.

B. Lap splices minimum 24 bar diameters.

C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

D. Place and consolidate grout fill without displacing reinforcing.

E. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.14 BUILDING EXPANSION JOINTS

A. Make joints 1-inch wide, unless otherwise indicated.

B. Keep joint clear of mortar by temporarily filling with polystyrene as wall is laid.

C. Stop horizontal joint reinforcement 1-inch from expansion joint.

D. Keep clean of mortar and debris.

E. Leave joint open and clean for installation of expansion joint as specified in Expansion Joint Cover Assemblies section.

3.15 CMU CONTROL JOINTS

A. Make joint 3/8" wide, unless otherwise indicated. Where indicated, align joints in concrete unit masonry backup with brick expansion joints.

B. Stop horizontal joint reinforcement 1-inch from control joint.

C. Control joints may be build in or sawcut, in accord with PCA Handbook.

D. Build in movement joints where indicated or recommended by the PCA Handbook and field located by Gardner Spencer Smith Tench and Jarbeau, PC, or as a minimum as follows:
1. In running walls spaced maximum 30'-0" o.c.
2. At corners, joint located one header or stretcher unit from corner.
3. At intersecting walls, either of which is more than 10'-0" long.
4. Above joints in foundations and floors and below joints in roofs and floors that bear on masonry walls.
5. At all abrupt changes in wall height.
6. At all changes in wall thickness, such as those at pipe or duct chases and those adjacent to columns or pilasters.
7. At a distance of not over one-half of the allowable joint spacing from bonded intersections or corners.
8. At door and window openings unless other crack control measures are used, such as joint reinforcement or bond beams.
    a. At one side of openings less than 6'-0" wide.
    b. At both sides of openings greater than 6'-0" wide.
9. Where control joints occur in running walls, provide sash block with rubber control joint filler.
10. Leave control joint open and clean for backer rod and caulking in accord with Joint Sealers section. Caulk joints exterior and interior.

E. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

F. Size control joint in accordance with Section 079005 - Joint Sealers for sealant performance.

G. Form joint as detailed.

3.16 BUILT-IN WORK

A. As work progresses, install built-in metal door frames, fabricated metal frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build into masonry construction organic materials that are subject to deterioration.

E. Install accessory materials in accord with Masonry Accessories section.
   1. Space pressure-relieving pads at control joints indicated on the drawings.
   2. Coordinate location of control joints in unit masonry backup.

F. Provide lintels and bond beams where indicated using lintel blocks laid with joints matching adjacent work. Reinforcement shall be as indicated and block filled with concrete.

3.17 REINFORCED AND GROUTED UNIT MASONRY

A. Align vertical unit masonry cells to be filled to maintain unobstructed vertical cell, continuous to foundation, equal to the cell void of an individual masonry unit. Remove mortar droppings and debris from cells.

B. Provide cleanouts at bottom of each vertical cell, at each pour of grout. Seal cleanouts after inspection of reinforcement, before grouting begins with concrete unit masonry face shell.

C. Fabricate in accord with approved shop drawings.

D. Install vertical reinforcing bar positioners at top of first course, at course below top of wall, and at maximum space of 192 vertical bar diameters between top and bottom bar positioner.

E. Provide dowels of same size as reinforcement at foundations at each vertical bar, as indicated on the drawings.

F. Install vertical reinforcement and horizontal bond beam reinforcement as indicated on drawings. Extend tops of vertical bars through openings made in bottom of bond beam units and bend horizontally into bond beam. Set anchor bolts and other devices indicated into bond beams prior to grouting.
   1. Placing tolerance for detailed position of vertical wall reinforcement: +/- 1/2".
   2. Minimum distance between masonry unit faces and reinforcing bars:
      a. Fine grout: 1/4".
      b. Coarse grout: 1/2".

G. Lap vertical bars not less than 2'-0". Extend bars into bond beams and foundation as indicated on drawings.

H. Stop horizontal bond beam reinforcement 3" back from both side of expansion and control joints.

I. At specified reinforced cells, bond beams and open cells indicated to receive grout, fill solid with grout as specified in Cement Grout For Reinforced Masonry section.

J. Wet masonry prior to placement of grout. Wet no masonry until mortar has set and wetting will not damage mortar or mortar bond.

K. Consolidate grout by working reinforcement bars and rodding non-reinforced cells.

L. Prevent grout seepage or spillage onto exposed masonry unit faces.

3.18 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.19 CUTTING AND FITTING

A. Where cutting is required, use power saws to provide clean, sharp, unchipped edges.

B. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape,and location.

C. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

D. Remove and replace masonry where appearance is unacceptable.

3.20 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Division 01.

B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C 140.

C. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, concrete unit masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

3.21 REPAIRING MASONRY

A. Replacement: Carefully remove areas of damaged masonry and replace with matching, undamaged units using mortar which matches original work.

B. Pointing: As joints are tooled, remove mortar with visible holes or mortar which cannot be compacted properly because of hidden voids, and replace with fresh mortar , filling each joint completely and tooling to match adjacent work.

3.22 CLEANING

A. Clean concrete masonry units as follows and as directed by the concrete masonry unit manufacturer:
   1. Clean masonry after mortar is thoroughly set and cured.
   2. Scrape off adhered mortar particles by hand, using non-metallic tools.
   3. Comply with directions of concrete unit masonry manufacturer and NCMA Tek Bulletin No. 45 for cleaning CMU.

B. Remove excess mortar and mortar smears on clay masonry as work progresses.

C. Replace defective mortar. Match adjacent work.

D. Clean soiled surfaces with cleaning solution and as recommended by the material manufacturer for the surface to be cleaned.

E. Use non-metallic tools in cleaning operations.

3.23 PROTECTION OF FINISHED WORK

A. Without damaging completed work, provide protective boards at exposed external corners which are subject to damage by construction activities.

B. Place pine straw adjacent to walls, thickness and width sufficient to prevent mud staining before and after cleaning.

C. Provide other protective measures as necessary to ensure that unit masonry work will be clean, free of staining from adjacent soils, and undamaged at substantial completion.

3.24 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Union County Commissioner's Office's property.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 GENERAL

A. Provisions of Division 01 apply to this section.

1.02 SECTION INCLUDES

A. This section includes the following shop fabricated steel and aluminum items.
   1. Rough hardware.
   2. Miscellaneous steel trim.
   3. Pipe bollards.

1.03 RELATED REQUIREMENTS

A. Division 01 - Testing Laboratory Services.

B. Section 042200 - Concrete Unit Masonry: Placement of metal fabrications in masonry.

C. Section 09 9000 - Painting and Coating: Paint finish.

1.04 REFERENCES

A. "Specification for the Design, Fabrication and Erection of Structural steel for Buildings, November 1, 1978," by the American institute of Steel Construction (AISC Specification).

B. "Specification for the Design of Cold-Formed Steel Structural Members," by the American Iron and Steel Institute (AISI Specification).

C. "Structural Welding Code - Steel, AWS Dl.l," or "Structural Welding Code -- Sheet Steel, AWS D1.3, by the American Welding Society (AWS Codes).

D. "Specification for Structural Joints Using ASTM A325 or A490 Bolts, August 14, 1980," by the Engineering Foundations' Research Council on Riveted and Bolted Structural Joints (Specification for Structural Joints).

E. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

I. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

J. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.

K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

L. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2014.

M. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric) 2014.

N. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021.

O. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2014.

P. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

R. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).

S. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

T. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Where installed metal fabrications are indicated to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for their preparation.

C. Product Data: Submit Product Data for manufactured items.
   1. Submit Product Data for primers, finishes, and grout.

D. Material Samples: Submit samples of primers and finishes on fabricated items.

E. Installation Instructions: Submit installation instructions for manufactured items.

F. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.

B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated them.

C. Qualify welding processes and welding operators in accordance with AWS Dl.l "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel," and D1.2 "Structural Welding Code - Aluminum."
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

D. Comply with the following as a minimum requirement:
   1. Design, fabricate, and install miscellaneous metals in accordance with AISC - Design, Fabrication, and Erection of Structural Steel for Buildings.
   2. AWS D-1.1 Code - Welding in Building Construction.
   3. Inspection of Welding: Refer to Section 01420: Testing and Inspection.
   4. Welding: Refer to Section 01410 and 01310: Testing Laboratory Services and Special Inspections.

E. Coordinate installation of accessory items required for metal fabrications.

1.07 DELIVERY, STORAGE AND HANDLING

A. Store miscellaneous metal items above grade on platforms, skids, or other required supports.

B. Protect from corrosion or damage.

1.08 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.
   1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

1.09 SEQUENCING AND SCHEDULING

A. Sequence and coordinate installation of wall handrails as follows:
   1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.
   2. Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked for benefit of Installer.

PART 2 PRODUCTS

2.01 FERROUS METALS

A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

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

C. Rolled Steel Floor Plates: ASTM A 786.

D. Steel Bars for Gratings: ASTM A 569 or ASTM A 36.

E. Wire Rod for Grating Cross Bars: ASTM A 510.

F. Steel Tubing: Product type (manufacturing method) and as follows:
   1. Cold-Formed Steel Tubing: ASTM A 500, grade as indicated below:-
      a. Grade A, unless otherwise indicated or required for design loading.
   2. Hot-Formed Steel Tubing: ASTM A 501.
      a. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating per ASTM A 53.

G. Uncoated Structural Steel Sheet: Product type (manufacturing method), quality, and grade, as follows:
   1. Cold-Rolled Structural Steel Sheet: ASTM A 611, grade as follows:
      a. Grade A, unless otherwise indicated or required by-design loading.
   2. Hot-Rolled Structural Steel Sheet: ASTM A 570, grade as follows:
      a. Grade 30, unless otherwise indicated or required by design loading.

H. Uncoated Steel Sheet: Commercial quality, product type (method of manufacture), as follows:
   1. Cold-Rolled Steel Sheet: ASTM A-366.
   2. Hot-Rolled Steel Sheet: ASTM A 569.

I. Galvanized Steel Sheet: Quality as follows:
   1. Structural Quality: ASTM A 446; Grade A, unless another grade required-for design-loading, and G90 coating-designation unless otherwise indicated:
   2. Commercial Quality: ASTM A 526, G90 coating designation unless otherwise indicated.

J. Steel Pipe unless indicated otherwise in structural drawings: ASTM A 53; finish, type, and weight class as follows:

1. Black finish, unless otherwise indicated.
2. Galvanized finish for exterior installations and where indicated.
3. Type F, standard weight (schedule 40), unless otherwise indicated, or another weight, type, and grade required by structural loads.
4. Type S, Grade A, standard weight (schedule 40), unless otherwise indicated, or another grade or weight or both required by structural loads.
5. Type S, Grade B, standard weight (schedule 40), unless otherwise indicated, or another weight required by structural loads.

K. Gray Iron Castings: ASTM-A 48, Class 30.

L. Malleable Iron Castings: ASTM A 47, grade 32510.

M. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

N. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.

O. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.

2.02 STAINLESS STEEL

A. Bar Stock: ASTM A 276, Type 302 or 304.

B. Tubing: ASTM A 554, Grade MT 304.

C. Pipe: ASTM A 312/A 312M, Grade TP 304.

D. Casting: ASTM A 743/A 743M, Grade CF 8 or CF 20.

E. Plate and Sheet: ASTM A 666, Type 304.

2.03 ALUMINUM

A. Extruded Bars and Shapes: ASTM B 221, alloys as follows:
1. 6061-T6 or 6063-T6 for bearing bars of gratings and shapes.
2. 6061-T1 for grating cross bars.

B. Aluminum-Alloy Rolled Tread Plate: ASTM B 632, alloys as follows:
1. 6061-T6 for platforms.
2. 6061-T4 for treads.

C. Aluminum Rivets: ASTM B 316, alloy 6053-T4 or 6061-T6.

D. Aluminum Sheet for Expanded Aluminum Grating: ASTM B 209, alloy 5052-H32.

E. Fasteners for Aluminum Gratings: Use fasteners made of same basic metal as fastened metal except use galvanized fasteners complying with ASTM A 153 for exterior aluminum units, unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.

2.04 GROUT AND ANCHORING CEMENT

A. Nonshrink Metallic Grout: Premixed, factory-packaged, ferrous aggregate grout complying with CE CRD-C 621, specifically recommended by manufacturer for heavy duty loading applications of type specified in this section.

B. Nonshrink Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

C. Interior Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Use for interior applications only.

D. Erosion-Resistant Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.

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

F. Products: Subject to compliance with requirements, provide one of the following:
   1. Nonshrink Metallic Grouts:
      a. "Metox RM"; Chem-Masters Corp.
      b. "Hi Mod Grout"; Euclid Chemical Co.
      c. "Embeco 885 and 636"; Master Builders.
      d. "Ferrolith G Redi-Mix and G-NC"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
      e. "Stoncrete MG1"; Stonhard, Inc.
   2. Nonshrink Nonmetallic Grouts:
      a. "Bonsai Construction Grout"; W. R. Bonsai Co.
      b. "Diamond-Crete Grout"; Concrete Service Materials Co.
      c. "Euco N-S Grout"; Euclid Chemical Co.
      d. "Kemset"; Chem-Masters Corp.
      e. "Crystex"; L & M Construction Chemicals, Inc.
      f. "Masterflow 713"; Master Builders.
      g. "Sealtight 588 Grout"; W. R. Meadows, Inc.
      h. "Sonogrout"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
      i. "Stoncrete MM 1"; Stonhard, Inc.
      j. "Five Star Grout"; U. S. Grout Corp.
      k. "Vibropruf #11"; Lambert Corp.
   3. Interior Anchoring Cement:
      a. "Bonsai Anchor Cement"; W. R. Bonsai Co.
      b. "Por-Rok"; Minwax Construction Products Division.
   4. Erosion-Resistant Anchoring Cement:
      a. "Super Por-Rok"; Minwax Construction Products Division.

2.05 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-61.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-11.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, nondrilling), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.

H. Toggle Bolts: Tumble-wing type, FS FF-B-88, type, class, and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.06 FABRICATION

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

B. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and over-stressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

C. Fit and shop assemble items in largest practical sections, for delivery to site.

D. Fabricate items with joints tightly fitted and secured.

E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
   1. Radius approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. For fabrication of Work exposed to view, provide only materials smooth and free of blemishes. Remove blemishes by grinding or by welding and grinding, before cleaning, treating, and installation of surface finishes including zinc coatings.

H. Form exposed Work true to line and level with accurate angles, surfaces, and straight sharp edges.

I. Form bent metal corners to the smallest radius possible without causing grain separation or otherwise damaging Work.

J. Form exposed connections with hairline joints, flush and smooth. Provide concealed fasteners wherever possible.

K. Remove loose rust, mill scale, cutting, and punching burrs.

L. Fabricate items in as large sections as practical to minimize assembly at the Project site.

M. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.07 ROUGH HARDWARE

A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.

B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.08 MISCELLANEOUS STEEL TRIM

A. Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for coordination of assembly and installation with other work.

B. Galvanize miscellaneous framing and supports in the following locations:
   1. Exterior locations.

2. Interior locations where indicated.

2.09 PIPE BOLLARDS

A. Fabricate pipe bollards from Schedule 80 steel pipe. Cap bollards with 1/4 inch minimum thickness steel base plate.

B. Fabricate sleeves for bollard anchorage from steel pipe with 1/4 inch thick steel plate welded to bottom of sleeve.

2.10 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete or masonry and items specified for painted finish.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.11 SHOP FINISH

A. Metal fabrications shall be provided with a coat of primer, except those indicated to be completed with exposed galvanized finish.

B. Primer: Lead-free red metal primer complying with Fed Spec TT-P-86G, Type I, II, or III; zinc molybdate complying with Fed Spec TT-P-645A. Minimum dry film thickness of primer shall be 2.0 mils.

C. Preparation for Primer Painting: Miscellaneous ferrous metal, except items specified galvanized, shall be thoroughly cleaned and prepared for painting, including removal of shipping oils or protective coatings, mill scale, grease, dirt and rust. Deliver to Project site primed or galvanized as indicated, and ready to receive Project site applied finishes.

D. Galvanized Metal Work to receive Paint: Clean oil, grease and other foreign materials from surfaces. Apply vinyl wash pretreatment coating. Follow manufacturer's instructions for drying time, and then prime with one coat of metal primer.

2.12 FINISHES - ALUMINUM

A. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

B. As Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

2.13 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

B. Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

C. Clean and strip primed steel items to bare metal where site welding is required.

D. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION, GENERAL

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

D. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

F. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

G. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

H. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.

I. Perform field welding in accordance with AWS D1.1/D1.1M.

J. Obtain approval prior to site cutting or making adjustments not scheduled.

K. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized , except surfaces to be in contact with concrete.

3.04 INSTALLATION OF BOLLARDS

A. Anchor bollards in concrete by means of pipe sleeves preset and anchored into concrete. After bollards have been inserted into sleeves, fill annular space between bollard and sleeve solid with nonshrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's directions.

3.05 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.06 ADJUSTING

A. Touch Up Damaged Surfaces:
   1. Shop Painted Finishes: Apply with brush to produce a minimum 2.0 mil dry film thickness.
   2. Galvanized Surfaces: Clean field welds, connections and damaged areas. Repair galvanized finishes in accord with ASTM A 780.

3.07 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 05 5210
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel pipe and tube railings.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.

B. Section 04 0511 - Masonry Mortaring and Grouting: Gouting associated with railings.

1.03 REFERENCE STANDARDS

A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.

B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.

C. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.

D. ASTM A 276 - Standard Specification for Stainless Steel Bars and Shapes; 2006.

E. ASTM A 480/A 480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2006b.

F. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2007.

G. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.

H. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2006a.

I. ASTM D 1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2004).

J. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 1996 (Reapproved 2001).

K. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.

1.04 PERFORMANCE REQUIREMENTS

A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1. Aluminum: AA 30, “Specifications for Aluminum Structures.”.
   2. Stainless Steel: 60% of minimum yield strength.
   3. Steel: 72% of minimum yield strength.

B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails:
      a. Uniform load of 50 lbs/ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Top Rails of Guards:
      a. Uniform load of 50 lbs/ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf(0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.

3. Infill of Guards:
    a. Concentrated loads of 200 lbf (0.89 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m) at any point in the system, including intermediate rails, balusters, or other elements composing infill area.
    b. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guardrails.

C. Thermal Movements: Provide exterior railings that allow for there movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
    1. Change (Range): 120 deg F (67 deg C), ambient; 180deg F (100 deg C), material surfaces.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.05 SUBMITTALS

A. Product Data: For the following:
    1. Manufacturer’s product lines of mechanically connected railing.
    2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
    1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type of exposed finish require:
    1. 6 inch (150mm) long sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
    2. Fittings and brackets.
    3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
        a. Show method of finishing members at intersections.

1.06 QUALITY ASSURANCE

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

B. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."

1.07 MOCK-UP

A. Locate where directed.

B. Mock-up may remain as part of the Work.

1.08 STORAGE

A. Store handrails and railings in a dry, well-ventilated, weathertight place.

1.09 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop

Drawings.

1. Provide allowance for trimming and fitting at site.

1.10 COORDINATION AND SCHEDULING

A. Coordinate installation for anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Coordinate installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

1. Steel Pipe and Tube Railings:
    a. Pisor Industries, Inc.
    b. Sharpe Products.
    c. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide material with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or framed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.03 STEEL AND IRON

A. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight(Schedule 40), unless another grade and weight are required by structural loads.

B. Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Casting: Either gray or malleable iron, unless otherwise indicated.

1. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.
2. Malleable Iron: ASTM A 47/A 47M.

2.04 FASTENERS

A. General: Provide the following:

1. Aluminum Railings: Type 304 stainless-steel fasteners.
2. Stainless-Steel Railings: Type 304 stainless-steel fasteners.
3. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
2. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Anchors: Provide cast-in-place, chemical or torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six

times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent agency.

2.05 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
   1. For aluminum railings, provide type and alloy as recommended producer of metal to be welded and as required for color match strength, and compatibility in fabricated items.

B. Shop Primers: Provided primers that comply with Division 09 Section “High-Performance Coatings.”

C. Zinc-Rich Primers for High-Performance Coated Steel: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
   1. Use primer with a VOC content of 420 g/L (3.5 lb/gal.)or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Carboline Company; Carbozinc 621.
      b. ICI Devoe Coatings; Catha-Coat 313.
      c. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Wire Mesh Infill: Carbon Steel, Cold Rolled, Woven - Lockcrimp Weave and Associated Hardware.
   1. Basis of Design: McNichols: www.mcnichols.com .
      a. Wire Mesh: 1" x 1" Opening (Square), 0.135" Thick Wire Diameter, 78% Open Area (Match Existing).
      b. U-Edging: Carbon Steel, 14 Gauge.

2.06 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structure loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural values of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections, unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welding surface matches contours of adjoining surfaces.

I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufactures's standard system of sleeve and socket fittings.

J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

K. Form changes in direction as follows:
1. Form changes in direction by flush bends, by inserting prefabricated flush-elbow fittings or as detailed.

L. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

M. Close exposed ends of railing members with prefabricated end fittings.

N. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.
1. At brackets and fittings fastened to plaster or gypsum board partitions, provide fillers made from crush-resistant material, or other means to transfer wall loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

P. Provide inserts and other anchorage devices for connecting railing to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

Q. For steel railing posts set in concrete, provide steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with steel plate forming bottom closure.

R. For aluminum railing posts set in concrete, provide aluminum sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with aluminum plate forming bottom closure.

2.07 FINSHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Provide exposed fasteners with finish matching appearance, including color and texture, of railing.

2.08 STEEL AND IRON FINISHES

A. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filling off smooth.

B. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

C. Preparation for Shop Priming of Uncoated Steel: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed railings:
   1. Interior Railings (SSPC Zone 1A): SSPC-SP 7/NACE No. 4, “Brush-off Blast Cleaning.”

D. Apply shop primer to prepared surfaces of galvanized steel railings, unless otherwise indicated. Comply with requirements for specified high-performance coating.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

E. Apply shop primer to prepared surfaces of steel railings, unless otherwise indicated. Comply with requirements in SSPC-PA 1, “Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel,” for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.02 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
   1. Do not weld, cut or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
   2. Set post plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
   3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.03 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 “Fabrication” Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement.

D. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches(150 mm) of post.

3.04 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete.Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, attached to post with set screws.

D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
   1. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.
   2. For stainless-steel pipe railings, weld flanges to post and bolt to supporting surfaces.
   3. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

3.05 ANCHORING RAILING ENDS

A. Anchor railing ends to concrete and masonry with round flanges connected to railing ends and anchored to wall construction with anchor and bolts.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and connected to railing ends using nonwelded connections.

3.06 ATTACHING HANDRAILS TO WALLS

A. Attach handrails to wall with wall brackets. Provide brackets with 1 1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface.
   1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets to building construction as follows:
   1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
   2. For hollow masonry anchorage, use toggle bolts.
   3. For steel-framed gypsum board partitions, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.

3.07 ADJUSTING AND CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

3.08 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Preservative treated wood materials.

C. Fire retardant treated wood materials.

D. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete: Setting anchors in concrete.

B. Section 064100 - Architectural Wood Casework: Miscellaneous blocking.

C. Section 072100 - Thermal Insulation.

D. Section 07 2610 - Weather Resistant Membranes: Water-resistive barrier over sheathing.

E. Section 07 3113 - Asphalt Shingles: Miscellaneous blocking.

F. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

A. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings 2015.

B. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings 2012.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2009.

D. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2015a.

F. AWPA C9 - Plywood -- Preservative Treatment by Pressure Processes; American Wood Protection Association; 2003.

G. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Protection Association; 2003.

H. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Protection Association; 2002.

I. AWPA U1 - Use Category System: User Specification for Treated Wood 2016.

J. PS 1 - Structural Plywood 2009.

K. PS 20 - American Softwood Lumber Standard 2010.

L. NLGA - National Lumber Grades Authority.

M. SPIB (GR) - Grading Rules 2014.

N. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17 2004, and supplements.

O. WWPA G-5 - Western Lumber Grading Rules 2011.

1.04 DEFINITIONS

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

B. SPIB - Southern Pine Inspection Bureau.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials, application instructions, and fire-retardant treatment.

C. Preservative-treated wood certification: Submit for Gardner Spencer Smith Tench and Jarbeau, PC's information only. Submit certification by treating plant, stating chemicals and process used, net amount of salts retained, conformance with applicable standards and moisture content after treatment.

D. Fire-retardant treatment certification: Submit for Gardner Spencer Smith Tench and Jarbeau, PC's information only. Submit certification by treating plant that fire-retardant treatment materials comply with governing ordinances and that treatment will not bleed through finished surfaces.

E. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Union County Commissioner's Office's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Lumber: Comply with PS 20 for lumber and PS 1-95 for construction and industrial plywood and approved grading rules and inspection agencies.
   1. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Design standards; spans, connections and design criteria for members not otherwise indicated shall comply with the following:
   1. American Institute of Timber Construction (AITC), "Timber Construction Manual."
   2. National Forest Products Association (NFPA):
      a. "National Design Specifications for Wood Construction," 1986 Edition, with Supplements.
      b. "Design Values for Wood Construction," July, 1986 Edition, with Supplements.
      c. "Span Tables for Joist and Rafters," 1977 Edition, with Supplements.

C. Product Identification:
   1. Lumber: Lumber shall bear the grade stamp of a listed grading rules association certified by the Board of Review of American Lumber Standards Committee (ALSC), identifying species or species combination, grade, moisture condition at time of surfacing, mill of origin and grading agency.
   2. Plywood: Plywood shall bear the stamp of the American Plywood Association (APA), indicating type, grade, thickness, exposure durability, span rating, agency compliance, species group, edging, finish and glue type.
   3. Preservative-treated wood products: Preservative-treated lumber and plywood shall bear the quality standard stamp of the applicator, indicating preservative type, exposure conditions, year of treatment, treatment plant and treatment supervising agency.
   4. Fire-retardant-treated wood products: Fire-retardant-treated lumber and plywood shall bear the stamp of Underwriters Laboratories, Inc., (UL) or other approved independent inspection agency, indicating treatment type or name, flame spread and treatment plant.

D. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   1. Obtain each type of fire-retardant-treated wood product through one source from a single producer.

E. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

1.07 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

C. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

D. Store no seasoned materials in wet or damp portions of building.

E. Protect sheet materials from breaking corners and damaging surfaces.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
   1. Grade-stamped commercial softwood conforming to PS 20-70 and referenced grading rules, unless otherwise indicated.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing (2 by 2 through 2 by 6):
   1. Species: Southern Pine.
   2. Grade: No. 2.

E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   1. Machine stress-rated (MSR) as follows:
      a. Fb-single (minimum extreme fiber stress in bending): 1350 psi.
      b. E (minimum modulus of elasticity): 1,300,000 psi.
   2. Species: Southern Pine.

F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

G. Miscellaneous Blocking, Furring, Nailers, and Framing: Pressure-preservative-treated or fire-retardant-treated as specified here-in:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards and general utility purposes: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Plywood wall sheathing: APA Rated Sheathing, Exposure 1, Group I, thickness indicated; pressure-preservative-treated or fire-retardant-treated as specified herein. Span ratings and load capacities shall be in accordance with fire-retardant-treatment manufacturer's design values for thickness required.

C. Plywood roof sheathing: APA Rated Sheathing, Exposure 1, Group I, thickness indicated; pressure-preservative-treated or fire-retardant-treated as specified herein. Span ratings and load capacities shall be in accordance with fire-retardant-treatment manufacturer's design values for thickness required.

D. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

A. Fasteners and Anchors: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Nails, Brads, and Staples: ASTM F 1667.
   3. Power-Driven Fasteners: CABO NER-272.
   4. Wood Screws: ASMEB18.6.1.
   5. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
   6. Lag Bolts: ASME B18.2.L.
   7. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
   8. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
      a. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
   9. Anchors: Toggle bolt type for anchorage to hollow masonry.

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

2.05 FACTORY WOOD TREATMENT

A. General: Unless specifically indicated to be preservative-treated, provide fire-retardant-treated materials.

B. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

C. Fire Retardant Treatment:
   1. Manufacturers:
      a. Basis of Design: Arch Wood Protection, Inc; Product Dricon: www.wolmanizedwood.com.
      b. Chemical Specialties, Inc: www.rockwoodspecialties.com.
      c. Hoover Treated Wood Products, Inc: www.frtw.com.
      d. Koppers, Inc: www.koppers.com.
      e. Substitutions: See Division 01 - Product Requirements.
   2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.
   3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat rough carpentry items as indicated .
      c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

D. General clarification, all drawings: All wood blocking within the building enclosure is to be fire-retardant treated.

E. Use treatment that does not promote corrosion of metal fasteners.

F. Preservative Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Viance, LLC: www.treatedwood.com.
      c. Osmose, Inc: www.osmose.com.
      d. Substitutions: See Division 01 - Product Requirements.

G. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
   1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   2. Treat lumber in contact with roofing, flashing, or waterproofing.
   3. Treat lumber in contact with masonry or concrete.
   4. Treat lumber less than 18 inches above grade.
      a. Treat lumber in other locations as indicated.
   5. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
      a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
      b. Treat plywood in contact with roofing, flashing, or waterproofing.
      c. Treat plywood in contact with masonry or concrete.
      d. Treat plywood less than 18 inches above grade.

e. Treat plywood in other locations as indicated.

H. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
1. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
2. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

I. General clarification, all drawings: All wood blocking outside the building enclosure is to be preservative pressure treated.

J. Exterior grade plywood sheathing detailed as back-up in parapet walls is to be preservative pressure treated.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

D. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit.
Locate nailers, blocking and similar supports to comply with requirements for attaching other construction.

E. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

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

G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. CABO NER-272 for power-driven fasteners.
2. Published requirements of metal framing anchor manufacturer.
3. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in the International One- and Two-Family Dwelling Code.

H. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

3.03 WORKMANSHIP

A. Install wood framing and carpentry work cut square on bearings, fitted and set to required lines and levels, and secured in place.

B. Lay out the work to provide correct openings to receive work of other trades.

C. Fire-retardant-treated wood:
1. Prevent exposure to water or moisture, and do not use id so exposed.
2. Only end cuts shall be made. Do not rip or re surface.
3. Attach using only hot-dipped galvanized nails and anchors.

D. Plates, blocking, nailers and miscellaneous framing:

1. Provide 2" nominal thickness members (concealed within metal stud assemblies) to support and secure finishing materials, fixtures, accessories, partitions, specialty items and trim (i.e. shelving, wall mounted coat hook units, marker/chalk/tack boards, toilet accessories, etc.) Provide fire-retardant-treated wood at rated wall assemblies.

E. Bolt to structural steel or metal framing at 4'-0" o.c., maximum.

F. Secure to concrete and masonry using cast-in bolts, powder-activated stud, sleeve or wedge type anchors spaced 4'-0" o.c., maximum.

G. Provide anchors within 3" of ends of members.

H. Provide linear runs in maximum practicable lengths, with joints in multiple members offset 3'-0", minimum.

I. Around roof perimeter and at roof penetrations, provide blocking equal to roof insulation thickness. Attach through decking into structural members at 2'-0" o.c., maximum, starting within 3" of each end. Space ends 1/2" for venting.

3.04 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes, AWC (WFCM) Wood Frame Construction Manual, and [_____].

E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

G. Construct corners and intersections with three or more studs. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

H. Do not splice structural members between supports.

3.05 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
   1. Coordinate locations with other work involved.

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

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

B. Wall Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to studs as recommended by manufacturer.

1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
3. Use only mechanically attached and drainable EIFS and exterior insulation with wall sheathing with laminated water-resistive and air barrier.
4. Apply manufacturer's standard seam tape to joints between sheathing panels. Use tape gun or hard rubber roller as recommended by manufacturer.

C. Roof Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to trusses as recommended by manufacturer.
1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.07 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.08 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.09 CLEANING

A. Waste Disposal: Comply with the requirements of Division 1.
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops.

B. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard 2012 (R2020).

B. ANSI A208.1 - American National Standard for Particleboard 2009.

C. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications 2016.

D. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

E. BHMA A156.9 - American National Standard for Cabinet Hardware 2015.

F. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber 1996a (Validated 2013).

G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2016.

H. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2002)

I. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

J. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress 2015.

K. PS 1 - Structural Plywood 2009.

L. PS 20 - American Softwood Lumber Standard 2010.

M. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
   1. Show details full size.
   2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
   3. Show locations and sizes of cutouts and holes for plumbing fixtures, grommets, faucets, soap dispensers and other items installed in cabinets.

C. Product Data: For each type of product indicated, including cabinet hardware and accessories and finishing materials and processes.

D. Samples for Initial Selection:
   1. Solid-surfacing materials.

E. Samples for Verification:

1. Solid surfacing materials, 12 inches square, for each type, color, pattern, and surface finish and specified edge material applied to 1 edge.
2. Corner pieces as follows:
   a. Cabinet front frame joints between stiles and rail, as well as exposed end pieces, 18 inches (450mm) high by 18 inches (450 mm) wide by 6 inches (150mm) deep.
   b. Miter joints for standing trim.
3. Exposed cabinet hardware and accessories, one unit for each type.
4. Product Certificates: Signed by manufacturers of woodwork certifying that the products furnished comply with the requirements,
5. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.
   1. Provide certificates of compliance.

B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project with a minimum of three years documented experience and whose products have a record of successful in-service performance. Shop is certified in AWI's Quality Certification Program.

C. Installers Qualifications: Member in good standing of the Architectural Woodwork Institute (AWI), or the Architectural Woodwork Manufacturers Association of Canada (AWMAC) and familiar with the AWI/AWMAC QSI.

D. Quality Certification: Provide inspection and quality certification of completed custom cabinets in accordance with AWI/AWMAC Quality Certification Program.

E. Source Limitation: Engage a qualified woodworking firm to assume undivided responsibility for production of cabinets with sequenced-matched wood veneers.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

B. Immediately upon delivery to jobsite, place materials indoors, protected from the weather.

C. Store materials a minimum of 6" off floor on framework or blocking and cover with protective waterproof covering providing for adequate air circulation and ventilation. Store materials in a dry, conditioned space.

D. Protect edges, ends, corner and surfaces of millwork fabrications from damage.

1.08 FIELD CONDITIONS

A. Environmental Limitations: During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction process to avoid delaying of Work.
   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.09 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Species and Cut for Transparent Finish: Red Oak, plain sawn or sliced.

C. Wood Species for Opaque Finish: Any closed-grain hardwood.

D. Wood Species unexposed: Standard Grade Lumber.

E. Wood Products: Comply with the following:
   1. Medium Density Fiberboard: ANSI A208.2, Grade MD.
   2. Particleboard: ANSI A208.1, Grade M-2.
   3. Softwood Plywood: DOC PS 1.
   4. Veneer Faced Panel Products (Hardwood Plywood): HPVA HP-1.

F. Thermoset Decorative Overlay: Particleboard complying with ANSI A208.1, Grade M-2, or medium-density fiberboard complying with ANSI A208.2, Grade MD, with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

G. Clear Tempered Float Glass for Doors: ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3; manufactured by horizontal (roller hearth) process, with exposed edges seamed before tempering, 1/4" (6 mm) thick, unless otherwise indicated.

H. Solid Surfacing Material Type: SS: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
   1. Colors, Patterns and Finishes: Selected from solid surfacing manufacturer's full range of colors and matte finishes.
      a. See Drawings and Finish Schedule.
   2. Manufacturer: Subject to compliance with requirements, provide solid surfacing material by one of the following:
      a. Basis of Design: Corian Solid Surfaces: www.corian.com.
      b. Avonite Surfaces : www.avonitesurfaces.com.
      c. Formica Corporation : www.formica.com.
      d. LG Hausys : www.lghausys.com.
      e. Wilsonart International, Inc : www.wilsonart.com.
      f. Substitutions: See Division 01 - Product Requirements.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 SOLID SURFACING MATERIAL COUNTERTOPS

A. Grade: Premium.

B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.

C. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.

D. Edge Treatment: Square, substrate built up to minimum 1-1/4 inch thick; fabricate tops in one piece with shop applied backsplashes and edges, unless otherwise indicated. Comply with solid surfacing material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

E. Back and End Splashes: Same material, same construction.

1. Splash Dimensions: 4 inch high by 1 inch thick, unless otherwise indicated.

F. Solid Surfacing Material: 3/4" (19 mm).

2.04 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

E. Shop cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
1. Seal edges of openings in countertops with a coat of varnish.

F. Install glass to comply with applicable requirements in division 8 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

G. Caulk inside and outside joints of plastic laminate woodwork with colored caulk matching plastic laminate.

H. Fill joints or seams between plastic laminate sheets with plastic seam filler.

I. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

J. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches, unless otherwise indicated.

K. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

L. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

2.05 FACTORY AND SHOP FINISHING

A. Grade: Provide finishes of same grades as items to be finished.

B. Sand work smooth and set exposed nails and screws.

C. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.

D. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, Conversion Varnish, Transparent.
1. Comply with requirements indicated below with sheen measured on a 60-degree gloss meter per ASTM D 523:
a. Grade: Premium.

b. AWI Finish System TR-4: Conversion varnish.
c. Staining: Match Gardner Spencer Smith Tench and Jarbeau, PC's sample.
d. Sheen: Satin, 30-50 gloss units.

PART 3 EXECUTION

3.01 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.02 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.03 INSTALLATION

A. Assemble cabinets and complete fabrication at Project site to comply with requirements for fabrication as herein described under Part 2, to extent that it was not completed in the shop.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
1. Tolerance: 1/8 inch in 8 feet.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets and counter bases to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.04 COUNTERTOPS

A. Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

B. Install countertops with no more than 1/8 inch in 8 feet sag, bow or other variation from straight line.

C. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.

D. Caulk space between backsplash and wall with sealant specified in Division 07.

3.05 ADJUSTING

A. Adjust installed work.
1. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects.
2. Adjust joinery for uniform appearence.

B. Adjust moving or operating parts to function smoothly and correctly.

3.06 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

B. Touch up shop-applied finishes to restore damaged or soiled areas.

3.07 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, and underside of floor slabs.

B. Batt insulation and vapor retarder in exterior wall and ceiling construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

D. Foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve a thermal and air seal.

1.02 RELATED REQUIREMENTS

A. Section 042200 - Concrete Unit Masonry: Masonry walls enclosing insulation.

B. Section 07 2400 - Exterior Insulation and Finish System: Board insulation on exterior side of walls, finished with weatherproof coating.

C. Section 072610 - Weather Resistant Membranes: Separate air barrier and vapor retarder materials.

D. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS

A. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation 2021.

B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2019.

C. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

F. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, product limitations, and joint tape and adhesives.

C. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/sle:
   1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.07 SEQUENCING

A. Sequence work to ensure fireproofing, firestop, and vapor retarder materials are in place before beginning work of this section.

PART 2 PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

A. Rigid Extruded Polystyrene Board Insulation: ASTM C 578, Type IV; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Location: Cavity wall construction and perimeter slab edge as shown on drawings.
      a. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
      b. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
      a. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
         1) R-5 per inch minimum.
      b. Compressive Resistance: 25 psi.
      c. Board Density: 1.3 lb/cu ft.
      d. Water Absorption, Maximum: 0.3 percent, by volume.
      e. Surface Burning Characteristics: Flame spread/Smoke developed index of 25 or less, when tested in accordance with ASTM E 84.
   4. Manufacturers:
      a. Dow Chemical Company: www.dow.com.
      b. Owens Corning Corp: www.owenscorning.com.
      c. Kingspan Insulation LLC: www.trustgreenguard.com.
      d. Substitutions: See Division 01 - Product Requirements.

2.02 BATT INSULATION MATERIALS

A. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
   1. Material: Glass or mineral fiber.
   2. Location as required and shown on the drawings:
      a. Foil-faced: Fiberglass blanket insulation meeting ASTM C665, Type III, Class as indicated.
         1) For concealed and exposed applications in walls, soffits, plenums, floors and ceilings areas: Class A; maximum 25 flame spread and 50 smoke development when tested in accordance with ASTM E84-89a.
         2) Water vapor permeance: Maximum 0.50 perm when tested in accordance with ASTM E96-90.
      b. Unfaced: Fiberglass blanket insulation meeting ASTM C665, Type I.
         1) Batt insulation for filling perimeter window and door shim spaces, and crevices in exterior wall and roof.

3. Thermal Resistance: R of 19 for vertical installation and R of 30 for horizontal installation.
4. Thickness:
   a. R of 19 batts: Minimum 6 1/4".
   b. R of 30 batts: Minimum 9 1/2".
5. Size: Manufacturer's standard width equal to spacing of framing members.
6. Accessories:
   a. Tape: Insulation manufacturer's standard foil faced tape or types as recommended; provided in widths required to cover joints.
   b. Fasteners and supports: Type as recommended by insulation manufacturer for installation conditions encountered.
      1) Protection: Where fasteners will be exposed to human contact after installation, protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap.
      2) Insulation Standoff: Provide spacer fabricated from galvanized mild steel sheet for fitting over spindle of insulation anchor to maintain air space of dimension indicated between face of insulation and substrate to which anchor is attached.
      3) Anchor Adhesive: Provide product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

B. Manufacturers:
1. CertainTeed Corporation: www.certainteed.com.
2. Guardian Building Products: www.guardianfiberglass.com.
3. Johns Manville: www.jm.com.
4. Owens Corning Corp: www.owenscorning.com.
5. Substitutions: See Division 01 - Product Requirements.

2.03 SPRAY-IN-PLACE INSULATION

A. Location:
1. At junctions of dissimilar wall and roof materials.
2. At underside of steel decking.

B. Acceptable products; subject to compliance with specified requirements:
1. Bayer MaterialScience; EcoBay CC: www.spf.bayermaterialscience.com.
2. Demilec (USA) LLC; HEATLOK SOY 200: www.demilecusa.com.
3. Henry Company; PERMAX 2.0: www.henry.com.
4. Icynene Inc; Icynene ProSeal Eco MD-R-210: www.icynene.com.
5. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com.
6. Rhino Linings Corporation; DuraTite 2.0: www.biobased.rhinolinings.com.
7. Substitutions: See Division 01 - Product Requirements.

C. Characteristics:
1. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, open or closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   a. Regulatory Requirements: Conform to applicable code for flame and smoke limitations.
   b. Aged Thermal Resistance (R-value): 5 (deg F hr sq ft)/Btu, minimum, when tested at 1 inch thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F.
   c. Water Vapor Permeance: Vapor retarder; 1 perm, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
   d. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.

e. Air Permeance: 0.004 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.5 psf.
f. Closed Cell Content: At least 90 percent.
g. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Weather resistant membranes: Specified in Section 072610 - Weather Resistant Membranes.

B. Sheet Vapor Retarder: Specified in Section 07 2500.

C. Adhesive: Type as recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 INSTALLATION GENERAL

A. Comply with manufacturer's product data for installation of each type of insulation. Install insulation fitted to adjacent construction and with tight joints to provide unbroken thermal barrier. Cut insulation around obstructions and protrusions; fill voids with insulation. Remove projections interfering with installation. Seal tears and holes in vapor barrier facing with foil tape.

3.03 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.
1. Place boards to maximize adhesive contact.
2. Install in running bond pattern.
3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Extend boards over expansion joints, unbonded to foundation on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.05 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.
1. Place membrane surface against adhesive.

B. Install boards horizontally on walls.
1. Embed in tacky dampproofing between reinforcement.
2. Place boards to maximize adhesive contact.
3. Install in running bond pattern.
4. Butt edges and ends tightly to adjacent boards and to protrusions.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

D. Cut insulation boards as required to extend through-wall flashing into exterior masonry wythes.

3.06 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and ceiling spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

F. Attach flanges to framing per manufacturer's recommendation.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

H. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.

I. Tape seal tears or cuts in vapor retarder.

J. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

3.07 SPRAY-IN-PLACE INSULATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Patch damaged areas.

D. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

E. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.08 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

B. Protect installed insulation including vapor barrier facing from damage due to weather exposure, physical abuse, work of construction trades and other causes.

C. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed by permanent construction immediately after installation.

END OF SECTION

SECTION 07 2400
EXTERIOR INSULATION AND FINISH SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Class PB composite wall cladding of rigid insulation and applied coating.

1.02 SUMMARY

A. Scope: Provide design and engineering, labor, material, equipment, related services, and supervision required, including, but not limited to , manufacturing, fabrication, erection, and installation for exterior insulation and finish systems (EIFS) as required for the complete performance of the work, and as shown on the Drawings and as herein specified.

B. Section Includes: The work specified in this Section includes, but shall not be limited to, Class PB (polymer-based) EIFS for the following applications:
   1. Over exterior glass mat gypsum sheathing board.

1.03 RELATED SECTIONS

A. Section 07 2610 - Weather Resistant Membranes: Membranes for buildings with EIFS exterior cladding.

B. Section 07 9005 - Joint Sealers: Perimeter and penetration sealants.

C. Section 09 2116 - Gypsum Board Assemblies: Metal studs.

1.04 REFERENCES

A. ASTM B 117, Standard Practice for Operating Salt Spray (Fog) Testing Apparatus.

B. ASTM C 954, Standard Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 inches to 0.112 inches in Thickness.

C. ASTM C 1002, Standard Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.

D. ASTM C 1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2003.

E. ASTM C 1177, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

F. ASTM D 578, Standard Specification for Glass Fiber Strands.

G. ASTM D 968, Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.

H. ASTM D 2247, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

I. ASTM D 3273, Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

J. ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials.

K. ASTM E 329, Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

L. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002.

M. ASTM E 548, Standard Guide for General Criteria Used for Evaluating Laboratory Competence.”

N. ASTM G 28, Standard Practice for operating light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Non-Metallic Materials.

O. EIMA (PB) - Guideline Specification For Exterior Insulation and Finish Systems, Class PB; EIFS Industry Members Association; 1984, Revised 1997.

P. EIMA (PM) - Guideline Specification For Exterior Insulation and Finish Systems, Class PM; EIFS Industry Members Association; 1984, Revised 1999.
   1. EIMA 101.01, Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation Finish Systems (EIFS), Class PB.
   2. EIMA 101.02, Standard Test Method for Resistance to Water Penetration of Exterior Insulation Finish Systems (EIFS), Class PB.
   3. EMIA 101.03, Standard Test Method for Determining the Tensile Adhesion Strength of Exterior Insulation Finish Systems (EIFS), Class PB.
   4. EIMA 101.86, Standard Test Method for Resistance of Exterior Insulation Finish Systems (EIFS), Class PB, to the Effects of Rapid Deformation (Impact).
   5. EIMA 105.01. Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation Finish Systems (EIFS), Class PB.

1.05 DEFINITIONS

A. EIFS: Exterior insulation and finish system(s).

B. EIFS refers to exterior assemblies composed of an inner layer board insulation and an outer layer composed of a glass-fiber-mesh-reinforced base coat applied directly to board insulation and a textured protective finish coat. These assemblies are applied to supporting substrates of construction indicated.

C. Designation PB for class of EIFS specified in this Section is Based on the classification developed by the EIMA. System in this Section refers to Class PB EIFS.

1.06 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Deflection: Based calculation for deflection on the combination of maximum direct loadings, building deflections, thermal stresses, and erection tolerances. Design the system to be without permanent deflections.
   2. Normal to Wall: Not to exceed L/360.
   3. Movement: Design the system to accommodate structural movement such as creep, shorting, and live load deflections, and thermal movement such as expansion and contraction.
   4. Impact: Design system to withstand impact loads without cracks, indentations, breakage, or other damage.
   5. Joints: Design system with sealant and bond breaker in a captive joint to reduce or eliminate shear stresses on sealant.
   6. Repairability: Design the system so that it may be repaired in the field, including, but not limited to, repair of major and minor damage, so as to result in restoration to original condition without detrimental effect in performance and appearance.
   7. Copings: Copings shall be designed to resist a point load of 250 pounds without damage, permanent deformation, or disengagement of anchorage or seals.
   8. Safety Factor: Design structural components of the system, including, but not limited to, framing members, welds, connections, adhesives, and sealants used as adhesives with a safety factor of not less than 1.5; so that failure will not occur at less than 1.5 times the maximum design wind pressure as shown on the Drawings. Failure is defined to include, but not be limited to, breakage, component disengagement, permanent distortion, or cracking.

B. Performance Requirements:
   1. General: Provide systems that comply with the following performance requirements:

a. Bond Integrity: Free from bond failure within system components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
b. Weathertightness: Resistant to water penetration from exterior into system and deterioration of thermal insulating effectiveness or other degradation of system and assemblies behind system, including, but not limited to, substrates, supporting wall construction, and interior finish.

2. Physical Properties of Class PB: Provide EIFS whose physical properties and structural performance comply with the following requirements when tested per methods referenced.
   a. Abrasion Resistance: Sample, consisting of 1 inch thick EIFS mounted on 1/2 inch thick gypsum board, cured for a minimum of 28 days, shows no evidence of cracking, checking, or loss of film integrity after exposure to 500 liters (132 gallons) of sand when tested per ASTM D 968, Method A.
   b. Absorption-Freeze Resistance: No visible deleterious effects and negligible weight loss after 60 cycles per EIMA 101.01.
   c. Accelerated Weathering Characteristics: sample of size suitable for test equipment and consisting of 1 inch thick EIFS mounted on 1/2 inch thick gypsum board, cured for 28 days, shows no evidence of cracking, flaking, or deleterious effects after testing for 2000 hours per Method 1 of ASTM G 23.
   d. Impact Resistance: Sample, consisting of 1 inch thick EIFS when constructed, conditioned, and tested per EIMA 101.86, Produces the following impact classification and range:
      1) Medium Impact Resistance: 50 inch-lb. To 89 inch-lb.
   e. Mildew Resistance: Sample, consisting of finish coat applied to 2 inch by 2 inch clean glass substrate, cured for 28 days, shows no mildew growth when tested per ASTM D 3273.
   f. Positive and Negative Wind Load Performance: Sample assembly, 48 inches by 48 inches in size, consisting of studs, sheathing board, and 1 inch thick EIFS, shows capability to withstand wind loads indicated when tested per ASTM E 330.
   g. Salt Spray Resistance: Sample, consisting of 1 inch thick EIFS mounted on 1/2 inch thick gypsum board, cured for 28 days, shows no deleterious effects after testing for 300 hours per ASTM B 117.
   h. Tensile Adhesion: No failure in adhesive, base coat, or finish coat; minimum 5 psi tensile strength before and after freeze/thaw and accelerated weathering tests per EIMA 101.03.
   i. Water Penetration: Sample, consisting of 1 inch thick EIFS mounted on 1/2 inch thick gypsum board, cured for 28 days, shows no water penetration into the plane of the innermost face of the test specimen under 2.86 psf of air pressure difference across the specimen during a 15 minute test period when tested per EIMA 101.02.
   j. Water Resistance: Sample, consisting of 1 inch thick EIFS mounted on 1/2 inch thick board, cured for 28 days, shows no deleterious effects after testing for 14 days per ASTM D 2247.

1.07 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Product data shall include, but shall not be limited to, the manufacturer’s specifications and installation instructions.

C. Material List: Include the name of the selection manufacturer and the name and number of each product to be used in the work. Coordinate with items in shop drawings.

D. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in the manufacturer’s standard product data. Submit shop

drawings showing fabrication and installation of system, including, but not limited to, plans, elevations, sections, details of components, joint locations and configurations within system and between system and construction penetrating it, and attachments to construction behind system. Include details of each typical and atypical Project conditions, including, but not limited to, relationships to adjacent trades, at a scale of not less than 6 inches equals 1 foot. Key details to plans and elevations.

E. Samples:
   1. Submit samples for initial color selections. Submit samples of each specified finish. Submit samples in form of manufacturer's color charts and small-scale samples consisting of actual units or sections of units showing full range of colors, textures, and finishes available.
   2. Submit samples for verification purposes in the form of 24 inch by 24 inch panels for each finish, color, texture, and pattern specified. Prepare samples using tools and techniques intended for actual work.

F. Quality Control Submittals:
   1. Design Data: Submit design calculations for the EIFS system and the connections for attaching it to the structure. Design data shall be signed and sealed by the professional engineer. Only the loading of the structure at the connections will be reviewed.
   2. Qualification Data: Submit product data for firms and persons specified in Quality Assurance Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, and other information specified.
   3. Product Test Reports: Submit product test reports from a qualified independent inspecting and testing agency evidencing compliance of components and systems with requirements based on comprehensive testing of current products.
   4. Sealant Compatibility and Adhesion Test Reports: Submit sealant compatibility and adhesion test reports from sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include joint sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
   5. Research Reports or Evaluation Reports: Submit research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence system's compliance with building code in effect for the Project.
   6. Certification:
      a. Submit designer's certificate that:
         1) He is a structural engineer registered in the State where the Project is located. Include registration number.
         2) He is the designer of the EIFS system and the connections for attaching it to the structure.
         3) He has coordinated the design of the EFIS system and the connections for attaching it to the structure with the design of the structure.
         4) He has visited the site and that to the best of his information, knowledge, and belief the EFIS system has been installed in accordance with his design.
      b. Submit manufacturer's certification that:
         1) He has reviewed and approved the design of the back-up framing system to be used to support the EIFS system.
         2) Materials not furnished by him, including, but not limited to, sealants, are acceptable.
         3) The Installer complies with requirements specified under the Quality Assurance Article.

G. Statement of Manufacturer's Review: Submit statement of manufacturer's review, signed by the Contractor, the Installer, and the Manufacturer, stating that the Drawings and Specifications, the shop drawings, and the product data have been reviewed by the manufacturer, and that they are in agreement that the selected materials, systems, and details are proper and adequate for the application shown, including, but not limited to, compatibility with adjacent materials and systems.

H. Statement of Application: Submit statement of application, in form stipulated by the Architect, signed by the Contractor and the Installer, stating that the work was provided in compliance with the Contract Documents and that the installation was proper for the conditions of application and use.

1.08 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of EIFS systems of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years.
   2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing EIFS systems similar in type and scope to that required for this Project, and shall be a approved by the manufacturer.
   3. Engineer Qualifications: The engineer shall be a professional engineer legally authorized to practice in jurisdiction where the Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of products similar to this Project in material, design, and extent, and that have a record of successful in-service performance.
   4. Inspecting and Testing Agency Qualifications: To qualify for acceptance, an independent inspecting and testing agency hired by the Contractor or manufacturer to test products shall demonstrate to the Architect's satisfaction that they are qualified according to ASTM E 329 to conduct testing indicated, as documented according to ASTM E 548.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

C. Fire-Test-Response Characteristics: Provide materials and construction that are identical to those tested with the following fire-test-response characteristics, as determined by testing per ASTM test method indicated below, by Underwriters Laboratories, Inc. (UL) or other testing and inspecting agencies acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable inspecting and testing agency.
   1. Flame Spread of Insulation Board and Finish Coats: 25 or less when tested individually per ASTM E 84.
   2. Smoke Developed of Insulation Board and Finish Coats: 450 or less when tested individually per ASTM E 84.
   3. Fire Resistance Characteristics: Where indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by inspecting and testing agency acceptable to authorities having jurisdiction.

D. Manufacturer's Field Representative: The Installer shall be responsible for providing continuous on-site observation and evaluation by a manufacturer's field representative or an independent inspecting and testing agency trained by, and acceptable to, the manufacturer.
   1. Manufacturer's field representative or inspecting and testing agency shall provide full-time continuous observation and review of the EIFS system work and shall be responsible for observation and evaluation, including, but not limited to, the following for compliance with manufacturer's specifications:
      a. Proper tolerances and installation of substrate.

b. Monitoring of temperatures to assure proper curing of work.
c. Assure proper application and workmanship to include, but not be limited to,
d. Tolerances specified.
e. Assure Project conditions specified for proper application of work are maintained.
f. Notify the Contractor, Union County Commissioner's Office, and Gardner Spencer Smith Tench and Jarbeau, PC immediately of any deviation from the Contract Documents, final shop drawings, or the manufacturer's specifications.

E. Pre-Installation Conference: Conduct pre-installation conference in accordance with Division 01 – PROJECT MEETINGS. Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Mock-ups shall be reviewed during the pre-installation conference. Pre-installation conference shall include, but shall not be limited to, the Contractor, the Installer, manufacturer's representatives, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Architect.

F. Single Source Responsibility: Obtain materials for system from one source and by a single manufacturer or by manufacturers approved by the manufacturer as compatible with other system components.

1.09 MOCK-UP

A. Mock-Ups: Prior to installation of the work, fabricate and erect mock-ups for each type of finish and application required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of work.
1. Locate mock-ups on site in location and size indicated or, if not indicated, as directed by Gardner Spencer Smith Tench and Jarbeau, PC.
2. Demonstrate the proposed range of aesthetic effects and workmanship to be expected in the completed work.
3. Obtain Gardner Spencer Smith Tench and Jarbeau, PC's acceptance of mock-ups before start of final unit of work.
4. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed unit of work.
a. When directed, demolish and remove mock-ups from the Project site.

B. Mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.

B. Storage: Protect adhesives and finish materials from freezing and temperatures in excess of 90 degrees F.
1. Protect Portland cement based materials from moisture and humidity. Store under cover off the ground in a dry location.
2. Protect insulation materials from exposure to sunlight.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.

B. Do not install finish or sealants when ambient temperature is below 40 degrees F.
1. Unless temporary protection and heat are provided to maintain ambient temperatures above 40 F during installation of wet materials and until they have dried thoroughly and become weather-resistant, but for not less than 24 hours after installation.

C. Do not leave installed insulation board exposed to sunlight.

1.12 SEQUENCING AND SCHEDULING

A. Coordinate installation of system with related units of work specified in other sections to ensure that wall assemblies, including, but not limited to, sheathing board, flashing, trim, and joint sealers, are protected against damage from the effects of weather, age, corrosion, and other causes.

1.13 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

B. Special Warranty: The Contractor shall warrant the work of this Section to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship. Such defects are hereby defined to include, but shall not be limited to, any evidence of early deterioration, weathering or aging, uncontrolled water penetration or air infiltration, deterioration of finishes, cracking, and any other evidence of deterioration or failure to comply with requirements of the Contract Documents. This special warranty shall extend the period of limitations contained in the General Conditions. The warranty shall be countersigned by the Installer and manufacturer.

C. Additional Owner Rights: The warranty shall not deprive Union County Commissioner's Office of other rights the owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

D. Warranty Period: Warranty period shall be seven years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Dryvit Systems, Inc: www.dryvit.com.
   2. Parex, Inc: www.parex.com.
   3. Degussa Wall Systems, Inc: www.senergy.cc.
   4. Sto Corp: www.stocorp.com.

B. Acceptable Products: Subject to compliance with requirements, provide one of the products listed within this Section under each individual product description, as specified.

2.02 CLASS PB SYSTEM

A. Exterior Insulation and Finish System: Synthetic base and finish coatings with fiberglass reinforcing mesh, over mechanically- and adhesive-attached expanded polystyrene board insulation; complying with performance requirements of EIMA Class PB system.

B. Compatibility: Provide adhesives, board insulation, reinforcing mesh, base and finish coat materials, sealants, and accessories that are compatible with one another and approved for use by the manufacturer.

C. Colors and Textures of Finish Coat: Provide Gardner Spencer Smith Tench and Jarbeau, PC’s selections from manufacturer’s full range of colors and textures for type of finish coat indicated.

D. Fastener for Exterior Sheathing Board: Provide 1 5/8 inches, No. 8 wafer-head steel drill screws complying with ASTM C 954, with an organic polymer coating or other corrosion protective coating having a salt spray resistance of more than 500 hours per ASTM B 117.

E. Weather Resistant Membrane: ASTM E 1677, Type I; air leakage at 25 mph wind pressure less than 0.06 cubic feet per minute per square foot, non-perforated.

F. Primer/Sealer: Provide manufacturer’s standard substrate conditioner designed to seal substrates from moisture penetration and to improve the bond between substrates of type

indicated and adhesive used for application of insulation.

G. Adhesive for Application of Insulation: Provide manufacturer's standard information designed for indicated use, compatible with substrate, and complying with the following requirements:
   1. Factory-mixed formulation designed for adhesive attachment of insulation to substrates of type indicated, as approved by the manufacturer.

H. Extruded Polystyrene Board Insulation: Provide rigid, cellular thermal insulation with closed cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578 for Type IV, 1.60 pcf minimum density and 25 psi minimum compressive strength; approved by the manufacturer for material qualities, including but not limited to, corner squareness and other dimensional tolerances.
   1. Provide insulation in boards not more than 24 inches by 48 inches and in thickness indicated but not less than that allowed by the manufacturer, nor more than 4 inches.
   2. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical drainage channels, slots, or waves on the back side of board.

I. Reinforcing Mesh: Provide balance, alkali-resistant open-weave glass fiber mesh treated for compatibility with other system materials, made from continuous multi-end strands with tensile strength of not less than 120 lbf per inch per EIMA 105.01; complying with ASTM D 578; and the following requirements for minimum weight:
   1. Intermediate Reinforcing Mesh: 9.5 ounces per square yard.
   2. Strip Reinforcing Mesh: 3.75 ounces per square yard.
   3. Detail Reinforcing Mesh: 4.0 ounces per square yard.
   4. Corner Reinforcing Mesh: 7.2 ounces per square yard.

J. Base Coat Materials: Provide manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials:
   1. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at the job site.

K. Primer: Provide manufacturer's standard factory-mixed elastomeric polymer primer for preparing base coat surface for application of finish coat.

L. Finish Coat Materials: Provide manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials:
   1. Factory-mixed formulation of polymer emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.

M. Water: Provide clean and portable water.

N. Mechanical Fastener Assemblies: Provide manufacturer's standard corrosion-resistant fastener assemblies, consisting of thermal cap, manufacturer's standard washer and shaft attachments, and fastener indicated below; selected for properties of pullout, tensile, and shear strength required to resist design loads of application indicated, capable of pulling fastener head below surface of insulation board, and of the following description:
   1. For attachment to steel studs from 0.033 inch to 0.112 inch in thickness, provide steel drill screws complying with ASTM C 954.
   2. For attachment to light gage steel framing members not less than 0.0179 inch in thickness, provide steel drill screws complying with ASTM C 1002.
   3. For attachment to masonry and concrete substrates, provide sheathing dowel in the form of plastic wing-tipped fastener with thermal cap, sized to fit insulation thickness indicated and to penetrate substrate to depth required to secure anchorage.

O. Trim Accessories: Provide type as designed or required to suit conditions indicated and to comply with the manufacturer's requirements, manufactured from vinyl plastic and complying with ASTM C 1063.

1. Casing Bead: Prefabricated one-piece type for attachment behind insulation, of depth required to suit thickness of coating and thickness of insulation as well, with face leg perforated for bonding to coating.
2. Weep Screed/Track: Prefabricated one-piece type for attachment behind insulation with perforated face leg extended to form a drip and weep holes in track bottom, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg; designed to drain incidental moisture that gets into wall construction to the exterior at terminations of EIFS with drainage.

2.03 MIXING

A. Comply with the manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as approved by the manufacturer. Mix materials in clean containers. Use materials within time period specified by the manufacturer or discard.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
   1. Verify that substrate is sound and free of oil, loose materials, or protrusions that could interfere with EIFS installation and is of a type that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are thoroughly dry.
   2. Verify that substrate surface is flat, with no deviation greater than 1/4 in when tested with a 10 ft straightedge.

B. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the installer.

3.02 PREPARATION

A. Protect contiguous work from moisture deterioration and soiling resulting from application of systems. Provide temporary covering and other protection needed to prevent spattering of exterior finish coatings on other work.

B. Protect system, substrates, and wall construction behind them from inclement weather during installation. Prevent infiltration of moisture behind system and deterioration of substrates.

C. Prepare and clean substrates to comply with the manufacturer's requirements to obtain optimum bond between substrate and adhesive for installation. Apply primer/sealer over substrates where required by the manufacturer for improving adhesion or for protecting substrates from premature degradation.

D. Install self-furring metal lath over solid substrates that are deemed unacceptable to receive adhesively applied insulation. Install in accordance with ASTM C 1063, except for butt-lapping instead of overlapping..
   1. Attach to concrete and concrete masonry using corrosion-resistant power or powder actuated fasteners or hardened concrete stub nails not less than 3/4 inch long and with heads not less than 3/8 inch wide. Ensure that fasteners are securely attached to substrate and spaced at maximum 16 inches on center horizontally and 7 inches vertically.

E. Apply primer to substrate as recommended by EIFS manufacturer for project conditions.

3.03 INSTALLATION - GENERAL

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

B. Install exterior sheathing board on metal framing to comply with sheathing board manufacturer's recommendations. Install with steel drill screws over weather resistant membrane. Space fasteners no more than 8 inches on center along framing with perimeter fasteners at lest 3/8 inch but less than 5/8 inch frame edges of boards.

C. Apply trim accessories at perimeter of system, at expansion joints, and elsewhere, as indicated and in accordance with the manufacturer's recommendations.
   1. Weep Screed/Track: Use at bottom termination edges, at window and door heads of EIFS with drainage, unless otherwise indicated.
   2. Casing Bead: Use at other locations.

D. Install in accordance with manufacturer's instructions and requirements and recommendations of EIMA Guideline Specification For Exterior Insulation and Finish Systems, Class PB.

E. Apply weather resistant membrane to approved substrate in strict accordance with EIFS manufacturer's instructions. Apply flashing tape as required at all openings, across expansion joints, and at changes in substrate material.

F. Install vent assemblies as recommended by EIFS manufacturer.

G. Accessories: Install starter track, back-wrap mesh or edge-wrap mesh at system terminations and other accessories as recommended by EIFS manufacturer, assuring that track is level and securely fastened.

H. Install expansion joints at locations indicated and as follows:
   1. Where expansion or control joints occur in surface of construction directly behind insulation.
   2. Where system abuts dissimilar materials.

3.04 INSTALLATION - INSULATION

A. Adhesively and mechanically attach insulation to comply with the following requirements:
   1. Apply adhesive to insulation by the notched trowel method in a manner that results in adhesive coating the entire surface of sheathing board once insulation is adhered to the board.
   2. Press and slide insulation board into place. Apply pressure over the entire surface of the insulation board to accomplish uniform contact, high initial grab, and an overall level surface.
   3. Mechanically attach insulation to substrate by method complying with the manufacturer's written requirements. Space fasteners according to manufacturer's written requirements for attachment to substrate for performance indicated. Install top surface of fastener head flush with plane of insulation. Install fasteners into or through substrate with the following minimum penetration:
      a. Steel Framing: 5/16 inch.
      b. Masonry: 1 inch.
   4. Allow adhered and mechanically attached insulation to remain undisturbed for period prescribed by the manufacturer, but not less than 24 hours, prior to beginning rasping and sanding insulation or application of base coat and reinforcing mesh.
   5. Apply insulation boards over dry substrates in courses with long edges oriented horizontally. Begin first course from drip screed and work upward. Work from perimeter casing beads toward interior of panels when possible. Apply a thin coat of adhesive to edges of insulation before inserting into trim accessories.
   6. Stagger vertical joints in successive courses to produce running bond pattern. Locate joints so that no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints at lest 8 inches from corners of window and door openings.
      a. Offset joints of insulation at lest 8 inches from joints in sheathing board.
      b. Offset joint of insulation at lest 8 inches from decorative grooves (false joints).

7. Interlock ends at internal and external corners.
8. Abut boards tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between insulation boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert without use of adhesive.
9. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes conforming to details indicated.
10. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/32 inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch.
11. Cut grooves, rabbets, and other features in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that conform accurately to profiles and locations indicated. Do not reduce insulation thickness at features to less than 3/4 inch.
12. Interrupt insulation where expansion joints are indicated in substrates behind EIFS.
13. Form joints for sealant application with back-to-back casing beads for joints within system and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casings beads and between perimeter casing beads and adjoining surfaces of width indicated.
14. Treat edges of insulation board at trim accessories by extending base coat, reinforcing mesh, and finish coat over face leg of accessories.
15. Coordinate flashing installation with installation of insulation to produce a wall system that does not allow water to penetrate behind protective coating.

3.05 INSTALLATION - CLASS PB SYSTEM

A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at all terminations of the EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
   1. Embed intermediate reinforcing mesh in wet base coat to produce wrinkle-free insulation with mesh continuous or lapped at corners and lapped or otherwise treated at joints to comply with the manufacturer's requirements. Completely embed mesh, applying additional base coat material if necessary, so that reinforcing mesh pattern is not visible.
   2. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches.
   3. Allow base coat to dry a minimum of 24 hours before next coating application.

B. Where indicated, apply a second base coat and second layer of intermediate reinforcing mesh, in same manner as first application. Do not apply until first base coat has cured.

C. Apply strip reinforcing mesh around openings extending 4 inches beyond perimeter. Apply additional 8 inch by 16 inch strip reinforcing mesh diagonally at corners of openings (re-entrant corners). Apply 8 inch wide strip reinforcing at both inside and outside corners unless base layer of mesh is lapped at lest 4 inches on each side of corners.
   1. At decorative grooves (false joints), apply strip reinforcing at lest 8 inches wide.
   2. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.

D. Where recommended by the manufacturer, apply primer over dry base coat according to the manufacturer’s written instructions.

E. Apply finish coat over cured base coat in thickness specified by the manufacturer to produce a uniform finish of texture and color matching reviewed sample.

F. Apply sealant at finish perimeter and expansion joints in accordance with Section 07 9005.

3.06 CLEANING AND PROTECTION

A. Do not permit finish surface to become soiled or damaged.

B. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive system coatings.

C. Remove excess and waste EIFS materials from project site.

D. Clean EIFS surfaces and work areas of foreign materials resulting from EIFS operations.

E. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the exterior insulation and finish system shall be without damage at time of Substantial Completion.

END OF SECTION

SECTION 07 2500
VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials to make below grade concrete slab water vapor-resistant and air tight.

B. Tape to seal joints and repair vapor retarder.

C. Pipe boots for sealing penetrations.

1.02 RELATED SECTIONS

A. Section 03 3000 - Cast-in-Place Concrete: Slabs on grade.

1.03 REFERENCES

A. ASTM D 882 - Tensile Properties of Thin Plastic Sheeting; 2002.

B. ASTM D 1709 - Standard Specification for Impact Resistance of Plastic Film by the Free-Falling Dart Method; 2004.

C. ASTM D 2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting; 2003.

D. ASTM D 3776 - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric; 1996 (Reapproved 2002).

E. ASTM E 84 - Surface Burning Characteristics of Building Materials; 2005.

F. ASTM E 96/E 96M - Water Vapor Transmission of Materials; 2005.

G. ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 1998 (Reapproved 2005).

H. ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 1997 (Reapproved 2004).

I. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films; 2004.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
      a. Include independent laboratory test results showing compliance with ASTM & ACI Standards.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Selection Samples: Submit manufacturer's samples of reinforced vapor retarders.

D. Verification Samples: For each product specified, submit samples representing actual product, color, and patterns, minimum size 6 inches square.

1.05 QUALITY ASSURANCE

A. Preinstallation Meeting: Convene a preinstallation meeting two weeks before start of installation of reinforced vapor retarders. Require attendance of parties directly affecting work of this section, including Contractor, Gardner Spencer Smith Tench and Jarbeau, PC, and installer. Review installation, protection, and coordination with other work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage:

1. Store products in manufacturer's unopened packaging until ready for installation.
2. Store materials in a clean, dry area in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 UNDER-SLAB VAPOR RETARDERS

A. Products:
1. Stego Industries LLC: Stego Wrap (15-Mil) Vapor Barrier: www.stegoindustries.com.
2. W.R. Meadows, Inc.: Perminator 15 Mil: www.wrmeadows.com.
3. Raven Industries: VaporBlock VBLP15: www.ravenefd.com.
4. Reef Industries, Inc.: Griffolyn 15 Mil: www.reefindustries.com.
5. Substitutions: See Division 01 - Product Requirements.

2.02 ACCESSORIES

A. General: Furnish accessories recommended by vapor retarder manufacturer for intended use and compatible with vapor retarder membrane.

B. Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive.
1. Weight: 3.75 pounds per 100 feet.
2. Thickness: 35 mils.
3. 3 Inch Seam Shear: 35 pounds.

C. Pipe Boots: Provide factory-fabricated pipe boots from a compatible material and pressure sensitive tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces and areas to receive reinforced vapor retarders. Notify Gardner Spencer Smith Tench and Jarbeau, PC in writing defects of work and other unsatisfactory site conditions that would cause defective installation of vapor retarders. Do not begin installation until unacceptable conditions have been corrected.

B. Verify site dimensions.

C. Commencement of work will imply acceptance of substrate.

3.02 INSTALLATION

A. Install reinforced vapor retarders in accordance with manufacturer's instructions and ASTM E 1643 at concrete slabs.

B. Install vapor retarders continuously at locations as indicated on the drawings. Ensure there are no discontinuities in vapor retarder at seams and penetrations.

C. Install vapor retarders in largest practical widths.

D. Ensure surface beneath vapor retarder is smooth with no sharp projections.

E. Join sections of vapor retarder and seal penetrations in vapor retarder with pressure sensitive tape. Ensure vapor retarder surfaces to receive pressure sensitive tape are clean and dry.

F. Immediately repair holes in vapor retarder with self-adhesive repair tape.

G. Seal around pipes and other penetrations in vapor retarder with pipe boots in accordance with manufacturer's instructions.

H. Lay vapor retarder over interior building area to receive concrete slab; lap edges 6" and seal with pressure sensitive tape over entire lap. Apply membrane in 8'-0" width. Lay membrane with seams perpendicular to and lapped in direction of pour. Turn edges of membrane up to within 1/2" of top of slab at intersection with vertical surfaces.

I. Where expansion or control joints are indicated in slab, lay vapor retarder continuous under joint filler.

J. Seal openings in vapor retarder around pipes and other protrusions with pressure sensitive tape. Fold at corners to form envelope.

K. No penetrations of the vapor retarder is allowed except for reinforcing steel and permanent utilities.

L. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides with pressure sensitive tape.

3.03 PROTECTION

A. Protect vapor retarder installation from damage until concrete slab is in place.

B. Immediately repair damaged vapor retarder in accordance with manufacturer's instructions.

END OF SECTION

SECTION 07 2610
WEATHER RESISTANT MEMBRANES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Weather resistant membranes for light commercial buildings with EIFS exterior cladding.

1.02 RELATED SECTIONS

A. Section 01 6000 - Product Requirements.

B. Section 09 2116 - Gypsum Board Assemblies.

C. Section 07 2400 - Exterior Insulation and Finish Systems.

1.03 REFERENCES

A. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 1998.

B. ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.

C. ASTM E 1677 - Standard Specification for an Air Barrier (AB) Material or System for Low-Rise Framed Building Walls; 2005.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Product data shall include, but not be limited to, specifications, installation instructions, and general recommendations from the manufacturer for types of products required.

C. Test Results: Submit copies of test results showing performance characteristics equaling or exceeding those specified.

D. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in manufacturer's standard product data.
   1. Submit manufacturer's installation instructions.

E. Qualification Data: Submit qualification data for firms and persons specified in Quality Assurance Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, and other information specified.

1.05 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of weather resistant membranes of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years.
   2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing weather resistant membranes similar in type and scope that required for this Project.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

1.06 DELIVERY STORAGE AND HANDLING

A. Deliver materials to Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.

B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following::
   1. Basis of design: DuPont Company; Wilmington, DE; ASD.; Product; Tyvek CommercialWrap: www.tyvek.com.
   2. National Shelter Products, Inc; Product; DRYline W: www.drylinewrap.com.
   3. Pactiv Corp.; Product; GreenGuard C2000 Building Wrap: www.green-guard.com.
   4. Substitutions: See Division 01 - Product Requirements.

B. Provide all weather resistant membranes from a single manufacturer.

2.02 MATERIALS

A. Classification: ASTM E 1677, Type I; air leakage at 25 mph wind pressure less than 0.06 cubic feet per minute per square foot.

B. Water Vapor Transmission: Greater than 20 perms, when tested in accordance with ASTM E 96 Procedure B.

C. Water Penetration Resistance: Minimum 78.7 inches per AATCC Test Method 127.

D. Sealing Tape: Provide pressure sensitive tape of type recommended by weather resistant membrane manufacturer for sealing joints and penetrations.

E. Fasteners:
   1. Steel Framing: Rust-resistant screws with washers.
   2. Masonry: Polyurethane or elastomeric adhesives.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to Union County Commissioner's Office and Gardner Spencer Smith Tench and Jarbeau, PC, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
   1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the installer.

3.02 PREPARATION

A. Surface Preparation: Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of weather resistant membranes. Protect adjacent surfaces. Clean and prepare surfaces in accordance with manufacturer's written instructions.

3.03 INSTALLATION

A. Install weather resistant membranes in accordance with manufacturer's instructions over exterior sheathing.
   1. Install under foam board of exterior insulation and finish system.

B. Seal joints and penetrations through weather resistant membranes with tape and fasteners before installation of finish material.

C. Ensure that weather resistant membranes are air tight, free from holes, tears, and punctures.
   1. Repair any tears or punctures in weather resistant membrane immediately before concealment by other work. Cover with weather resistant membrane tape or another layer of weather resistant membrane.

D. Tape all window and door penetrations in accordance with manufacturer's instructions.

3.04 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to Installer, that shall ensure that the weather resistant membranes shall be without damage at time of substantial Completion.

END OF SECTION

SECTION 07 3113
ASPHALT SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt shingle roofing.

B. Self-Adhering Flexible sheet membranes for eave protection, valley protection, and roof penetrations.

C. Synthetic Roof Underlayment.

D. Associated metal flashings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000: Miscellaneous wood blocking.

B. Section 07 2100: Batt insulation.

C. Section 07 6200: Edge and cap flashings.

1.03 REFERENCE STANDARDS

A. ASTM D225 - Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules 2007.

B. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing 2017.

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2020.

D. ASTM D3161/D3161M - Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method) 2020.

E. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules 2019.

F. ASTM D3909/D3909M - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules 2014.

G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free 2007 (Reapproved 2018).

H. ASTM D6380/D6380M - Standard Specification for Asphalt Roll Roofing (Organic Felt) 2003 (Reapproved 2018).

I. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

J. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.

C. Shop Drawings: For metal flashings, indicate specially configured metal flashings, fastening methods and locations, and installation details.

D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern ; for color selection.

E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Union County Commissioner's Office's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain ridge and hip cap shingles and self-adhering sheet underlayment through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.
   1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.07 FIELD CONDITIONS

A. Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.
   1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

B. Do not install shingles when surface temperatures are below 45 degrees F.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.
   1. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 5 years nonprorated.
   2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 80 mph for 10 years from date of Substantial Completion.
   3. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.

C. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within 2 years from date of Substantial Completion.

1.09 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Asphalt Shingles: 200 sq. ft of each type, in unbroken bundles.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Products: Subject to compliance with requirements, provide one of the products specified.

2.02 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
   1. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.
   2. Algae Resistance: Granules treated to resist algae discoloration.
   3. Color and Blends: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's full range.

B. Products:
   1. CertainTeed Corporation; Product Landmark Pro: www.certainteed.com.
   2. GAP Materials Corporation; Product Timberline AH: ww.gaf.com.
   3. Owens Corning; Product Oakridge Pro AR 40: www.owenscorning.com.
   4. Substitutions: See Section 01 6000.

2.03 UNDERLAYMENT MATERIALS

A. Ice and Water Barriers: For valleys, around roof penetrations, rakes and eaves (first 4'-0" minimum from face of building).
   1. Felts: ASTM D 226 or ASTM D 4869, Type I, asphalt-saturated organic felts, nonperforated.
   2. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mii- thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.
      a. Products:
         1) CertainTeed Corporation; Product WinterGuard: www.certainteed.com.
         2) GAP Materials Corporation; Product SormGuard: www.gaf.com.
         3) Owens Corning; Product WeatherLock Flex: www.owenscorning.com.
         4) Substitutions: See Section 01 6000.

B. Underlayment:
   1. Felts: High Traction, Slip-Resistant surface.
   2. Synthetic Roof Underlayment, Non-Asphaltic, Polypropylene Construction: ASTM D 226, UV Resistant UL Listed ANSI/UL 790 Class A.
      a. Products:
         1) CertainTeed Corporation; Product DiamondDeck: www.certainteed.com.
         2) GAP Materials Corporation; Product Tiger Paw Premium: www.gaf.com.
         3) Owens Corning; Product Deck Defense: www.owenscorning.com.
         4) Substitutions: See Section 01 6000.

C. Starter Shingle:
   1. Laminated-Strip Asphalt Starter: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
      a. Products:
         1) CertainTeed Corporation; Product Swiftstart: www.certainteed.com.
         2) GAP Materials Corporation; Product QuickStart: www.gaf.com.
         3) Owens Corning; Product Starter Shingle Roll: www.owenscorning.com.
         4) Substitutions: See Section 01 6000.

2.04 RIDGE VENTS

A. Rigid Ridge Vent:
   1. Plastic Ridge Vents: Extruded plastic with vent openings that do not permit direct water or weather entry; flanged to receive shingles.
      a. Products:
         1) CertainTeed Corporation; Product Ridge Vent Filtered: www.certainteed.com.
         2) GAP Materials Corporation; Product Cobra Ridge Vent: www.gaf.com.
         3) Owens Corning; Product VentSure: www.owenscorning.com.
         4) Substitutions: See Section 01 6000.

2.05 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch- diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
   1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter.

D. Staples: Standard wire shingle type, of hot dipped zinc coated steel, 16 wire gage, 0.0508 inch diameter, 15/16 inch crown width, of sufficient length to penetrate through roof sheathing or 3/4 inch into roof sheathing or decking.

E. Plastic Cement: ASTM D4586/D4586M, asphalt roof cement.

F. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

2.06 METAL FLASHINGS

A. Metal Flashings: Provide sheet metal eave edge, gable edge, open valley flashing, and other flashing indicated.
   1. Form flashings to profiles indicated on drawings.
   2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
   3. Hem exposed edges of flashings minimum 1/4 inch on underside.
   4. Coat concealed surfaces of flashings with bituminous paint.

B. Sheet Metal Flashing and Trim: Comply with requirements in Section 07 6200.

C. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

D. Vent Pipe Flashings: ASTM B 749, Type LSI 121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

PART 3 EXECUTION

3.01 EXAMINATION

A. With Installer present, examine substrates, areas, and conditions, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
   1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.

2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.

3.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

3.03 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

3.04 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.
   1. Eaves: Extend from edges of eaves 48 inches beyond interior face of exterior wall.
   2. Rakes: Extend from edges of rake 48 inches beyond interior face of exterior wall,
   3. Valleys: Extend from lowest to highest point 24 inches on each side.
   4. Hips: Extend 24 inches on each side.
   5. Ridges: Extend 36 inches on each side without obstructing continuous ridge vent slot.
   6. Sidewalls: Extend beyond sidewall 24 inches and return vertically against sidewall not less than 4 inches.
   7. Roof-Penetrating Elements: Extend beyond penetrating element 24 inches and return vertically against penetrating element not less than 4 inches.

B. Synthetic Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with roofing nails.
   1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

3.05 INSTALLATION - METAL FLASHING AND ACCESSORIES

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 07 6200.
   1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

C. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

D. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

E. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.

F. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

3.06 INSTALLATION - SHINGLES

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches wide with self-sealing strip face up at roof edge.
   1. Extend asphalt shingles 3/4 inch over fascia at eaves and rakes.
   2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt shingle strips with a minimum of roofing nails and in location according to manufacturer's written instructions.
   1. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.

E. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in the valley. Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches short of valley centerline. Trim upper concealed corners of cut-back shingle strips.
   1. Do not nail asphalt shingles within 6 inches of valley center.
   2. Set trimmed, concealed-comer asphalt shingles in a 3-inch- wide bed of asphalt roofing cement.

F. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

G. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
   1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

H. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of counterflashings.

I. Complete installation to provide weather tight service.

3.07 PROTECTION

A. Do not permit traffic over finished roof surface.

3.08 SAMPLE ROOFING INSTALLER'S WARRANTY

A. WHEREAS [Insert name] of [Insert address], herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
   1. Owner: Union County Commissioner's Office.
   2. Address: [Insert address.]
   3. Area of Work: Asphalt Shingles and related components installation.
   4. Acceptance Date: [Insert date.]
   5. Warranty Period: 2 years from date of Substantial Completion.
   6. Expiration Date: [Insert date.]

B. AND WHEREAS Roofing Installer has contracted (either directly with Union County Commissioner's Office or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
      a. lightning;
      b. peak gust wind speed exceeding 90 mph;
      c. fire;
      d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
      f. vapor condensation on bottom of roofing; and
      g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Union County Commissioner's Office.
   2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
   3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
   4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
   5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
   6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
   7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
   8. IN WITNESS THEREOF, this instrument has been duly executed this [Insert day] day of [Insert month], [Insert year].
      a. Authorized Signature: [Insert signatures.]

1) Name: [Insert name.]
2) Title: [Insert title.]

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including copings, gutters and downspouts.

1.02 RELATED SECTIONS

A. Section 040090 - Masonry Accessories: Exposed and unexposed flashing in masonry.

B. Section 073113 - Asphalt Shingles: Flashings associated with shingle roofing.

C. Section 079005 - Joint Sealers.

D. Section 099000 - Painting and Coating: Field painting.

1.03 REFERENCES

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 1998.

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2002.

C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2005.

E. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2004a.

F. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.

G. ASTM B 32 - Standard Specification for Solder Metal; 2004.

H. ASTM B 101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction; 2002.

I. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2004.

J. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2004.

K. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2000.

L. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details. Distinguish between shop and field assembled work. Include the following:
1. Identify material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for fastening, joining, supporting, and anchoring cleats, and attachments to adjoining work.
4. Details of expansion-joint covers, including showing direction of expansion and contraction.

C. Product data: Indicate product description, finishes and installation instructions for all manufactured products, including interface with adjacent materials and surfaces.

D. Samples: Submit two samples, 6 x 6 inch in size illustrating material, finish, and fabrication details of typical standing seam, external corner, and internal corner.

E. Samples for Verification: For each type of exposed finish required, prepared on Sample of size indicated below:
1. Sheet Metal Flashing: 12-inches (300-mm) long. Include fasteners, closures, and other attachments.
2. Trim: 12-inches (300-mm) long. Include fasteners and other exposed accessories.
3. Gutters and Downspout: 12-inches (300-mm) long. Include brackets, supports, and expansion joint.
4. Accessories: Full-size Sample.

F. Submittals schedule: Obtain Gardner Spencer Smith Tench and Jarbeau, PC's acceptance of submittals prior to pre-roofing conference.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.07 PROJECT CONDITIONS

A. Provide protection or avoid traffic on completed roof surfaces.

B. Prevent overloading roof with stored materials.

C. Support no roof-mounted equipment directly on roofing system.

D. Ascertain that work of other trades which penetrates roof or is to be made watertight by roof is in place and approved prior to installation of sheet metal flashing and trim.

E. At the completion of the construction of the roof drainage system, the Contractor shall supply to Gardner Spencer Smith Tench and Jarbeau, PC a written survey of the system, to confirm that the downspouts and cast iron boots are unobstructed and free of debris, that slopes and elevations meet specified requirements and to determine that there are no birdbaths in excess of the allowable limits.

1.08 MOCK UP

A. Prior to installation of the work, fabricate and erect mock-ups for each type of finish and application required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of work.
   1. Locate mock-ups on site in location and size indicated or, if not indicated, as directed by Gardner Spencer Smith Tench and Jarbeau, PC
      a. Construct mock-ups for the following type of sheet metal flashing and trim:
         1) Coping.
         2) Conductor heads.
         3) Scuppers.
         4) Exposed trim.
         5) Gutters and Downspouts.
      b. Construct Mock-ups for the following type of metal wall panel:
         1) Erect a minimum of 100 sq. ft. of wall panels. Approved, undamaged mock-up may remain as part of the finished work.
   2. Demonstrate the proposed range of aesthetic effects and workmanship to be expected in the completed work.
   3. Obtain Gardner Spencer Smith Tench and Jarbeau, PC's acceptance of mock-ups before start of final unit of work.
   4. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed unit of work.
      a. When directed, demolish and remove mock-ups from the Project site.

B. Coordination: Coordinate work of this Section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance, durability of work, and protection of materials and finishes.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene one week before starting work of this section.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials which may cause discoloration or staining.

C. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

1.11 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

1.12 WARRANTIES

A. Warrant flashing and sheet metal work to be free of defects in materials and workmanship. Warranty period shall be three years. Combine warranty with roofing warranty.

B. Finish warranty: Warrant fluoropolymer coating to remain free of imperfections, checking, crazing, peeling, chalking or fading for a period of ten years, in accord with AAMA 605.2-92 (R1994).

C. Coping warranty: Provide manufacturer's fifteen year material and labor warranty against wind-related damage, roof membrane damage and leakage. Warranty period shall begin at Date of Substantial Completion.

D. Warranties shall begin at the Date of Substantial Completion.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Aluminum: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
   1. Anodized Aluminum Sheet: ASTM B 209, 5005-H14, with a minimum thickness of 0.050-inch except as indicated below.
      a. Gravel Stops, Gutters, Downspouts, Scuppers and Conductor Heads: Minimum 0.063 thickness.
      b. Copings: Minimum 0.063 thickness.
   2. Extruded Aluminum: ASTM B 221, Alloy 6063-T52, with minimum thickness of 0.080-inch for primary legs of extrusions that are anodized, unless otherwise indicated.

B. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, with a minimum thickness of 0.0625 inch except not less than 0.0937-inch thick for application where burning (welding) is involved.

2.02 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Burning Rod for Lead: Provide same composition as lead sheet.

B. Solder: ASTM B 32, Grade Sn50, used with rosin flux.

C. Fasteners: Provide same metal as sheet metal flashing or other non-corrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

D. Asphalt Mastic: SSPC Paint 12, solvent type asphalt mastic, normally free of sulfur and containing no asbestos fibers, compounded for 15 mil dry film thickness per coat.

E. Mastic Sealant: Provide polyisobutylene; non-hardening, non-skinning, nondrying, non-migrating sealant.

F. Elastomeric Sealant: Provide generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07900 - Joint Sealers.

G. Epoxy Seam Sealer: Provide two-part, non-corrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior non-moving joints, including but not limited to, riveted joints.

H. Adhesives: Provide type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

I. Paper Slip Sheet: Provide 5 pounds per 100 square feet red rosin-sized building paper conforming to FS UU-B-790, Type 1, Style 1b.

J. Polyethylene Underlayment: ASTM D 4397, minimum 6.0-mil thick black polyethylene film, resist to decay when tested according to ASTM E 154.

K. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed; non-corrosive; size and thickness required for performance.

L. Roofing Cement: ASTM D 4586, Type 1, asbestos-free, asphalt-based.

M. Downspout Strainers: Provide strainers to be inserted into outlet tubes inside conductor heads made of the same base material as the gutter.

N. Sheet lead: Minimum 4.0 lbs./sq. ft., hard type.

O. Soldering materials:
   1. Solder: Meeting ASTM B32-96, alloy grade SN50, 50% pig lead and 50% block tin.
   2. Solder flux:

a. For galvanized metal: Muriatic acid neutralized with zinc.
b. For lead: Non-corrosive rosin.

P. Mastic: as recommended by roofing manufacturer.

Q. Fasteners: Same material or compatible with sheet metal being fastened.
1. Nails: Flat head, needle point, not less than 12 ga. and of sufficient length to penetrate substrate 1" minimum.
2. Expansion shields: Lead or bronze sleeves.
3. Screws: Self-tapping type, with round heads.
4. Bolts: Furnished complete with nuts and washers.
5. Rivets: Round head, solid type.
6. Blind clips and cleats: Same gauge as sheet material.

R. Butyl sealant for concealed joints:
1. Acceptable products:
a. Pecora Corp., BC-158.
b. Protective Treatments, Inc., 707.
c. Tremco, Inc., Butyl Sealant.
2. Type: One part, non-skinning butyl sealant.

S. Pour grade sealant for pitch pockets:
1. Acceptable products:
a. Mameco International, Vulkem 45.
b. Pecora Corp., NR 201 Urexpan.
c. Sonneborn Building Products, Div. of ChemRex, Inc., Sonolastic SL-1.
d. Tremco, Inc., Polyroof.
2. Characteristics: Self-leveling, one-part polyurethane; grey color.

T. Bituminous coating: Cold-applied, asphalt mastic meeting SSPC-Paint 12-82, minimum 30 mils thickness.

U. Waterproof membrane subflashing for installation under copings and expansion joint covers, and over blocking.
1. Acceptable products; subject to compliance with specified requirements:
a. Under dark color copings, flashing and at high temperature conditions:
1) Polyguard products, Inc., Polyguard Deck Guard.
2) W.R. Grace, Vycor Ultra.
3) Nicolon Mirafi Group, Miradri WIP 300HT.
b. Under metal flashing:
1) Polyguard products, Inc., Polyguard Deck Guard.
2) W.R. Grace, Vycor Ice and Water Shield.
3) Nicolon Mirafi Group, Miradri WIP 200.
2. Characteristics:
a. Type: Self-adhering rubberized asphalt sheet complying with ASTM D1790-94.
b. Thickness: 40 mils minimum.
c. Tensile strength: 250 psi minimum when tested in accord with ASTM D412-97.
d. Elongation: 250% when tested in accord with ASTM D412-97, Die C Modified.
e. Provide primers, sealants and accessories required for a waterproof installation.

V. Membrane flashing for installation over subflashing, under expansion joint covers and copings: Modified bitumen flashing sheet as specified in Modified Bituminous Membrane Roofing section.

2.03 SPECIAL FINISHES

A. Fluoropolymer coating finish:

1. Two-coat, coil-applied, baked-on 70% fluoropolymer coating system based on Elf Atochem, Kynar 500 resin or Ausimont U.S.A., Inc., Hylar 5000 resin (polyvinylidene fluoride, PVDF), formulated by a licensed manufacturer and applied by manufacturer's approved applicator to meet AAMA Publication 605.2-92.
2. Coating system shall provide minimum 1.0 mil dry film thickness consisting of minimum 0.20 mil primer and minimum 0.80 mil color coat.
3. Colors: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's line of standard colors.
4. Work to receive fluoropolymer coating includes all copings, fascias, wall caps, expansion joint covers, gutters, conductor heads, downspouts and other flashing and sheet metal exposed to view from building elevations.

B. Location of Fluoropolymer finish:
1. Scuppers through parapets, conductor heads, prefabricated copings, gravel stops, flashings, gutters and downspouts.
2. Miscellaneous exposed flashings as indicated on drawings.

2.04 FABRICATION

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1-inch (25-mm) deep, filled with elastomeric sealant concealed within joints.

F. Conceal Fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

G. Fabricate cleats and attachments device from same material as accessory being anchored or from compatible, noncorrosive metal.
1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.05 GUTTER AND DOWNSPOUT FABRICATION

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch (2400-mm) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
1. Expansion Joints: Butt type.
2. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen.
3. Gutters with Girth 21 to 25 Inches (530 to 640 mm): Fabricate from the following material:
a. Aluminum: 0.050-inch (1.2-mm) thick.

B. Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
   1. Hanger Style: Straps.
   2. Downspout Boots: Cast iron.
   3. Downspouts 1-inch (25.4-mm) less than width of gutters: Fabricate downspouts from the following material:
      a. Aluminum: 0.050-inch (1.2-mm) thick.

C. SMACNA Manual fabrication requirements:
   1. Square Gutters: Figure 1-2, Style A.
   2. Rectangular Downspouts: Figure 1-32B.
   3. Gravel stops: Similar to Figure 2-1A.
   4. Copings: Figure 3-1, similar but without surface attachments and with welded corners.
   5. Gutter Expansion Joint: Butt Type, Figure 1-7.
   6. Downspout Strainer: Figure 1-24D.
   7. Roof Penetration Hoods: Figure 4-15A.

2.06 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop) and Fascia Caps: Fabricate in minimum 96-inch (2400-mm) long, but not exceeding 10-foot (3-m) long, sections. Furnish with 6-inch (150-mm) wide joint cover plates.
   1. Joint Style: Butt, with 12-inch (300-mm) wide concealed backup plate.
   2. Fabricate parapet scuppers from the following material:
      a. Aluminum: 0.050-inch (1.2-mm) thick.

B. Roof and Roof to Wall Transition Expansion-Joint Cover:
   1. Fabricate from the following material:
      a. Aluminum: 0.040-inch (1.0-mm) thick.

C. Base Flashing:
   1. Fabricate from the following material:
      a. Aluminum: 0.040-inch (1.0-mm) thick.

D. Counterflashing:
   1. Fabricate from the following material:
      a. Aluminum: 0.040-inch (1.0-mm) thick.

E. Flashing Receivers:
   1. Fabricate from the following material:
      a. Aluminum: 0.040-inch (1.0-mm) thick.

2.07 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet I -49 for specified wind zone and as indicated.
   1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 24-inch centers.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:

1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
2. Seal with sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

2.08 MISCELLEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following material:
   1. Stainless Steel: 0.0187-inch (0.5-mm) thick.

2.09 FINISHES

A. General: Comply with NAAMM MFM for recommendations relative to application and designations of finishes.

B. Finishes:
   1. General: Provide high performance organic coating specified below on the following substrates:
      a. Aluminum: Comply with AA DAF-45 for finish designation and application recommendations. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designing aluminum finishes.
      b. Coil-Coated Galvanized Steel Sheet Finish: Apply system by coil-coating process on galvanized steel sheet as recommended by coating manufacturers and applicator.
   2. High Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
      a. Fluoropolymer Two-Coat Coating System: Manufacturer's standard two-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.
      b. Color and Gloss: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's standard choices for color and gloss.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

C. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
   1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.
   3. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods,

protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protects against galvanic action by painting contract surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
   1. Coat side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
   2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and covert with slip sheet or install a course of polyethylene underlayment.
   3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   1. Space cleats not more than 12-inches (399-mm) apart. Anchor each cleat with fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24-inches (600-mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch (25-mm) deep, filled with elastomeric sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4-inches (32-mm) for nails and not less than 3/4-inch (19-mm) for wood screws.
   1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
   2. Aluminum: Use aluminum or stainless-steel fasteners.
   3. Copper: Use copper or stainless-steel fasteners.
   4. Stainless Steel: Use stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1-inch (25-m) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
   2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealant."

I. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

J. Install work in accord with approved shop drawings and applicable standards. Sheet metal items shall be true to line, without buckling, creasing, warp or wind in finished surfaces.

K. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

L. Apply plastic cement compound between metal flashings and felt flashings.

M. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

N. Seal metal joints watertight.

O. Coordinate flashing at roof surfaces with roofing work to provide weathertight condition at roof terminations.

P. Perform field joining of lengths as specified for shop fabrication.

Q. Isolate dissimilar materials to prevent electrolysis. Separate using bituminous coating.

R. Seaming: Form seams in direction of flow. Steel seams shall be flatlock with cleats soldered. Aluminum seams shall be flatlock with cleats soldered. Aluminum seams shall be flatlocked and filled with butyl sealant. Lap seams occuring in members sloping 45 degrees or more than 4", minimum; bed in flashing cement.

S. Secure sheet metal items using continuous cleats, clips and fasteners as indicated. Perform no exposed face fastening.

T. Fastening:
   1. Nails: Confine to one edge only of flashing 1'-0" or less in width. Space nails at 4" o.c., maximum. Provide neoprene washers for nails.
   2. Cleats: Continuous, formed to profile of item being secured.
   3. Clips: Minimum 2" wide by 3" long, formed to profile of being secured. Space at 2'-0" o.c., maximum.

U. Form joints in linear sheet metal to allow for 1/2" minimum expansion at 12'-0" o.c., maximum, and maximum 2'-0" from corners. Provide 1'-0" wide backup plate at intersections. Form plates to profile of sheet metal item.

V. At joints in linear sheet metal items, set sheet metal over backup plate and set cover plate over sheet metal in two beads of butyl sealant, 1/4" in diameter, minimum. Extend sealant over all metal surfaces. Accurately mate components for positive seal. Allow no sealant to migrate onto exposed surface.

W. Gutters and downspouts:
   1. Construct with riveted and soldered joints, lapped 1", minimum, in direction of flow. Provide 1/2" minimum expansion joints at 30'-0" o.c., maximum. Form expansion joints in accord with SMACNA Manual, Figure 1-6, lap type or 1-7, butt type.
   2. Hang gutters with high points equidistant from downspouts, evenly sloped toward downspouts. Support gutters in accord with SMACNA Manual, Figure 1-19A and as detailed on the drawings.
   3. Secure downspouts to exterior walls at 6'-0" o.c., maximum, using straps and expansion type fasteners in accord with SMACNA Manual, Figure 1-35C. Lap downspouts joints 1-1/2", minimum, and solder joints.
   4. Provide downspout strainers in all downspouts and conductor heads.
   5. Where downspouts empty onto lower roof surfaces, provide precast concrete splashblocks as specified in Splashblocks section.

X. Pitch pockets and roof penetrations flashing: Refer to Modified Bituminous Membrane Roofing section for membrane installation.

3.04 PREFABRICATED COPING INSTALLATION

A. Install prefabricated copings in accord with manufacturer's product data, true to line.

B. Install membrane subflashing under copings, secured under backup plates and continuous cleats.
   1. Install membrane subflashing fully adhered to substrates in accord with manufacturer's product data, except where more stringent requirements are specified herein.

2. If required, prime surfaces to receive membrane materials. Allow primer to dry until tack-free. Prime only area which can be covered with sheet membrane during work period. Reprime surfaces which are not covered within 24 hours of primer application.
3. Install membrane materials with side and end laps recommended by product data. Begin installation at low points, lapping succeeding sheets to shed water.
4. Membrane applications shall be fully adhered, smooth, straight and free of blisters, buckles, fishmouths and wrinkles affecting the complete adherence of the membrane. Patch and repair defective work in accord with manufacturer's product data. Areas which exhibit defective areas or generally poor or improper workmanship shall be removed and replaced.
5. Double membrane at changes in plane by application of a centered membrane strip. Cover strip completely with full width sheet.
6. Seal around protrusions and terminations in accord with product data.
7. Repair punctures and tears in membrane by patching with membrane material prior to protection board installation. Trowel-apply roofing cement at exposed edges of patch.

C. Install modified bitumen roof membrane flashing sheet up and over parapet walls, over subflashing, as indicated; refer to Modified Bituminous Membrane Roofing section for flashing membrane.

D. Install anchor plate at 5'-0" o.c. maximum under copings. Install concealed splice plates at intersections. Set copings over splice plates in full bed of sealant or extruded butyl tape, 1/2" from intersection edges.

E. Make weathertight fit, allowing for expansion and contraction as recommended by manufacturer's product data.

F. Attach materials using aluminum or stainless steel fasteners. Exposed fasteners shall match metal in finish.

3.05 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36-inches (900-mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.
2. Loosely lock straps to front gutter bead and anchor to roof deck.
3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24--inches (600-mm) apart.
5. Anchor gutter with spikes and ferrules spaced not more than 24-inches (600-mm) apart.
6. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.24 m) apart. Install expansion joint caps.

C. Downspouts: Join sections with 1-1/2-inche (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1-inch (25-mm) away from walls; locate fasteners at top and bottom and at approximately 60-inches (1500-mm) o.c. in between, or as indicated on drawings.
1. Connect downspouts to underground drainage system indicated.

3.06 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as

indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4-inches (100-mm) over base flashing. Install stainless-steel draw band and tighten.

C. Counterflashing: Coordinate installation of counterflashing umbrella with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4-inches (100-mm) over base flashing. Lap counterflashing joints a minimum of 4-inches (100-mm) and bed with elastomeric sealant.
   1. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
   1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
   2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.07 WALL FLASHING INSTALLATION

A. General: Install sheet metal flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of formed through-wall flashing is specified in Division 04 Section.

C. Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4-inches (100-mm) beyond wall openings.

3.08 MISCELLANEOUS FLASHING INSTALLATION

A. Overhead-Piping Safety Pans: Suspend pans from pipe and install drain line to plumbing waste or drain line. Provide positive slope to drain.

B. Support Flashing: Coordinate installation of equipment flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.09 FIELD QUALITY CONTROL

A. See Division 01 - Quality Requirements, for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.10 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Clean and neutralize flux material. Clean off excess solder and sealants.

C. Remove temporary coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

E. Protect all downspouts from construction debris.

END OF SECTION

SECTION 07 6500
FLEXIBLE FLASHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials to make door and window frames, piping, conduit, duct and similar penetrations water vapor-resistant and air tight.

B. Self-adhering rubberized asphalt flashings.

C. Mastic for setting and sealing joints.

1.02 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

A. Through-wall flashings to be built into masonry cavity are furnished under Section 04 0090 - Masonry Accessories.

B. Underslab Vapor Retarders are furnished under Section 07 2600 - Vapor Retarders.

1.03 RELATED SECTIONS

A. Section 040090 - Masonry Accessories.

B. Section 042200 - Concrete Unit Masonry.

C. Section 06 1000 - Rough Carpentry: Flashings at openings and sills.

D. Section 07 3113 - Asphalt Shingles: Flashings associated with shingle roofing.

E. Section 07 2400 - Exterior Insulation and Finish System: Flashings at openings.

F. Section 09 2116 - Gypsum Board Assemblies: Sheathing.

1.04 REFERENCES

A. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.05 PERFORMANCE REQUIREMENTS

A. Installed Product and Accessories shall exhibit no visible water leakage when tested per ASTM E 331 and shall perform as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration.

B. Installed Product and Accessories shall exhibit an air leakage rate not exceeding 0.02 L/s*m2 at 75 Pa (0.004 CFM/ft2 at 1.57 PSF) according to ASTM E 283. Air leakage shall not exceed this rate while Product and Accessories remain soundly adhered after exposure to sustained and gust wind loading according to ASTM E 330.

C. Installed Product and Accessories shall perform as a vapor barrier, installed on the predominantly warm side of the insulation.

D. Product shall consist of nominal 0.040 inch (40 mils) thickness membrane consisting of smooth surfaced, cross-laminated high-density polyethylene (HDPE) film fully-coated with rubberized asphalt adhesive. Film shall be legibly imprinted with manufacturer's brand name, logo and contact information. Membrane shall be provided in rolls of various widths interleaved with disposable silicone release paper.

1.06 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, limitations, including manufacturer's printed instructions for evaluating and preparing substrate, technical data, and tested physical and performance properties.

1. Include independent laboratory test results showing compliance with ASTM & ACI Standards.

C. Shop Drawings: Provide drawings showing locations and extent vapor barrier, including details for substrate joints and cracks, seaming and pipe boots, sheet flashings, penetrations, tie-ins with adjoining construction, and other termination conditions.

D. Samples: Provide 3x6 inch (75x150-mm) minimum size, of each vapor retarder material required for the Project.

E. Installer certificates signed by manufacturer certifying that Installers comply with requirements under the "Quality Assurance" Article.

F. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Company with at least five years of successful experience in weathertight installation of flashing.

B. Vapor Permeability (Perm): Measure in accordance with ASTM E 96 Procedure E.

C. Single-Source Responsibility: Obtain vapor retarder materials from a single manufacturer regularly engaged in manufacturing vapor retarder.

D. Field-Constructed Mock-Ups: Prior to installation on Project, apply Product and Accessories on mock-up to verify details under shop drawing submittals, to demonstrate tie-ins with adjoining construction and other termination conditions and to become familiar with properties of materials in application.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in manufacturer's sealed containers and packaging, bearing manufacturer's name and product identification.

B. Stack flashing materials to avoid twisting, bending, and abrasion. Protect materials from weather before installation.

C. Store mastic materials in sealed containers under cover.

1.09 WASTE MANAGEMENT AND DISPOSAL

A. Separate and recycle waste materials in accordance with Section - Construction Waste Management and Disposal, and with the Waste Reduction Work Plan.

B. Place materials defined as hazardous or toxic waste in designated containers.

C. Ensure emptied containers are stored safely for disposal away from children.

1.10 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
   1. Do not apply vapor retarder in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of vapor retarder materials.

C. Do not apply Product or Accessories over incompatible materials.

D. Observe safety and environmental measures indicated in Manufacturer's MSDS, and mandated by federal, state and local regulations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Subject to compliance with specified requirements:
   1. Carclisle Coatings & Waterproofing Inc; Product: Self-Adhering Thru-Wall Flashing: www.www.carlisle-ccw.com.
   2. Grace Waterproofing Products; Product: Perm-A-Barrier Wall Flashing: www.grace.com.
   3. Hohman & Barnard, Inc; Product: TeXtroflash Flashing: www.h-b.com.

4. Polyguard Products, Inc., Product: 400 TWF Product: www.architectural.polyguardproducts.com.

B. Substitutions: See Division 01 - Product Requirements.

2.02 MATERIALS

A. Flexible Flashing: Self-Adhering Flashing; 40 mil thick membrane comprised of 32 mils of highly adhesive rubberized asphalt integrally bonded to an 8 mil high density, cross laminated polyethylene film.

B. Primer: Manufacturer's special primer formulated to prepare surfaces for self-adhering flashing.

C. Termination bar for flexible membrane flashing with or without sheathing backup: Minimum Stainless Steel 1/8" thick 1-1/2" wide continuous with holes 8" on center.
   1. Termination Mastic:
      a. Description: Rubberized asphalt-based mastic with 200 g/L max. VOC Content.
      b. Apply a bead or trowel coat of mastic along flashing vertical and horizontal edges, seams, cuts, and penetrations.

2.03 FABRICATION

A. Forming: Fabricate flashings true to shape and accurate in dimension. Form pieces in longest possible lengths to minimize joints. Fold flashing at corners and at ends of pans instead of cutting.

B. Joints: Provide not less than 4 inches of overlap at flashing joints.

2.04 SEALANTS

A. Sealant approved by Manufacturer. Shall conform to ASTM C 920 Type 1 or 2, Grade NS, Class 25 or 50.

B. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

2.05 ADHESIVES

A. Contact Adhesive: Compatible with sheet seal and substrate and approved by Manufacturer.

B. Mastic: Compatible with sheet seal and substrate and approved by Manufacturer.

C. Fill Compound: Compatible with sheet seal and substrate and approved by Manufacturer.

D. Aerosol Insulation Adhesive: Compatible with sheet seal and substrate and approved by Manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to receive flashing are thoroughly dry, free from loose materials, and reasonably smooth, with no sharp edges or projections.

B. Verify that locations to receive flashing are sloped so water that enters will drain to building exterior.

C. Verify that surfaces and conditions are ready to accept the work of this section, with Installer present, for compliance with requirements. Do not proceed with installation until unsatisfactory conditions have been corrected.
   1. Notify Gardner Spencer Smith Tench and Jarbeau, PC in writing of anticipated problems using vapor retarder over substrate including but not limited to:
      a. Cracks in concrete and masonry.
      b. Anticipated problems applying Product and Accessories over substrate.

D. Concrete shall be cured for a minimum of seven days.

E. Surfaces shall be sound, dry and free of oil, grease, dirt, excess mortar or other contaminants.

F. Surfaces shall be supported and flush at joints without large voids.

G. Masonry joints shall be struck flush and completely filled with mortar. Mortar droppings shall be removed from masonry ties and surfaces.

H. Damaged or improperly-fastened sheathing shall be remedied to comply with building code and sheathing manufacturer's requirements.

3.02 PREPARATION

A. Self-Adhering Flashing: Prime all surfaces to receive self-adhering flashing, and allow to dry for not less than 20 minutes prior to flashing application.

B. Fill cracks, gaps and joints exceeding 1/4 inch width with fill compound or joint sealant.

C. Fill rough gaps around pipe, conduit and similar penetrations with mortar, non-shrink grout or Polyurethane Foam.

3.03 INSTALLATION

A. General: Comply with recommendations of SMACNA Architectural Sheet Metal Manual.
   1. Lap joints minimum of 4 inches and seal watertight with mastic.
   2. Carry flashing vertically as detailed, but not less than 6 inches above horizontal plane.
   3. Extend head and sill flashings not less than 6 inches beyond edges of openings and turn up to form watertight pan; seal with mastic.

B. Coordination: Interface flashing work with adjacent and adjoining work to ensure best possible weather resistance and durability of completed flashing.

C. Masonry Flashing: Comply with requirements of sections where masonry installation is specified.

D. Flashing in Steel to Masonry Construction: Install over solid backing, both vertically and horizontally. Secure in place with mastic; avoid puncturing installed flashing with nails or other fasteners.

E. Self-Adhesive Sheets:
   1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle-fashion to shed water and seal laps air tight.
   3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that all laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
   5. At wide joints, provide extra flexible membrane allowing joint movement.

F. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

G. Install as directed by manufacturer, level and true to line. Provide Flexible Membrane flashing across all steel columns or steel beams inside a concrete masonry unit wall with or without sheathing backup whether or not specifically indicated.

H. Terminate membrane 4" minimum on each side of masonry substrates. Overlap adjacent lengths 6" over each subsequent lower membrane for a water-tight system.

I. Provide termination bars for edges of membrane flashing terminating on concrete masonry unit faces. Minimum Stainless Steel 1/8" thick 1-1/2" wide continuous with holes 8" on center. Provide termination bars predrilled at spacing to match spacing of cold formed metal framing.

J. Apply a bead or trowel coat of mastic along flashing vertical and horizontal edges, seams, cuts, and penetrations.

K. Provide a full bed of sealant at outside edge of flexible flashing and termination bars. See Section 079005 - Joint Sealers.

3.04 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

3.06 PROTECTING AND CLEANING

A. Protect from damage during application and remainder of construction period, according to manufacturer's written instructions.

END OF SECTION

SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

C. Joints of a nature similar to that of joints indicated on the schedule shall be sealed with same sealer, whether indicated on the drawings to be sealed or not.

1.02 RELATED REQUIREMENTS

A. Section 07 2610 - Weather Resistant Membranes: Sealants required in conjunction with air barriers and vapor retarders:

B. Section 09 2116 - Gypsum Board Assemblies: Acoustic sealant.

C. Joint sealers in mechanical work: Division 23.

D. Joint sealers in electrical work: Division 26.

1.03 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants 2017.

B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2018.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.05 DEFINITIONS

A. Substrates:
   1. M-type substrates: Concrete, concrete masonry units, brick, mortar, or natural stone. The term "masonry" shall mean brick, stone, and concrete masonry work.
   2. G-type substrates: Glass and transparent plastic glazing sheets.
   3. A-type substrates: Metals, porcelain, glazed tile, and smooth plastics.
   4. O-type substrates: Wood, unglazed tile, and substrates not included under other categories.
   5. NT-type substrates: Surfaces not exposed to vehicular or pedestrian traffic.
   6. T-type substrates: Surfaces exposed to vehicular or pedestrian traffic.

B. Sealing: Making exterior and interior construction voids, junctions, or joints, air tight, dust tight, and water tight.

C. Joint Failure: A sealed joint exhibiting one or more of the following:
   1. Air or water, or both, infiltration or leakage.
   2. Dust infiltration.
   3. Sealant material migration.
   4. Loss of adhesion to bonded surfaces.
   5. Bonding of sealer to joint filler material or bond breaker material.
   6. Loss of cohesion.
   7. Discoloration or fading.
   8. Staining or marring of adjacent work or materials.

1.06 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, color availability, and instructions for installation.

C. Samples: Submit three samples, 3 x 3 inch in size illustrating sealant colors for selection.
   1. Submit samples of manufacturer's standard material colors for standard color sealants.
   2. Submit samples of custom color sealant materials matching color sample provided by Gardner Spencer Smith Tench and Jarbeau, PC.
   3. Samples shall be actual materials or literature depicting actual colors of standard color materials. Gardner Spencer Smith Tench and Jarbeau, PC reserves the right to reject work not in conformance with selected colors, based on samples submitted.

D. Adhesion Compatibility Test Results: Submit a letter from sealant manufacturer indicating that adhesion and compatibility testing has been performed on actual samples of substrate as noted above and, that materials are compatible and that adhesion is acceptable. Indicate requirements for primers or special preparation.

E. Certified Product Test Reports: Independent testing agency reports showing compliance with all specified requirements.
   1. Reports may be on tests conducted up to 24 months before submission, provided the products tested were aged specimens of the same formulation as that to be used.

F. Certificates: For each sealer, provide manufacturer's certificate stating that the product complies with the specifications and is appropriate for the use intended.
   1. Submit letter of certification from sealant manufacture indicating that specified FDA Approved Sealant complies with FDA regulations and certifiable grades.

1.07 JOB CONDITIONS

A. Protection of Adjacent Surfaces:
   1. Protect by applying masking material or manipulating application equipment to keep materials in joint. If masking materials are used, allow no tape to touch cleaned surfaces to receive sealant. Remove tape immediately after caulking, before surface skin begins to form.
   2. Remove misapplied materials from surfaces by using solvents and methods recommended in writing by manufacturer.
   3. At surfaces from which materials have been removed, restore to original condition and appearance.

1.08 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

D. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.09 MOCK-UP

A. Provide mock-up of sealant joints in conjunction with window, wall, and air barrier system under provisions of Section 042100 - Brick Masonry.

B. Construct mock-up with specified sealant types and with other components noted.

C. Locate where directed.

D. Mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original containers or bundles with labels showing manufacturer, product name or designation, color, shelf life, and installation instructions.

1.11 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

B. Do not install sealers if any of the following conditions exist:
   1. Air or substrate temperature exceeds the range recommended by the sealer manufacturer or is below 40 degrees F.
   2. Substrate is wet, damp, or covered with snow, ice, or frost.
   3. Dimensional Limitations: Do not install sealers if joint dimensions are less than or greater than that recommended by sealer manufacturer; notify Gardner Spencer Smith Tench and Jarbeau, PC and get sealer manufacturer's recommendations for alternative procedures.
   4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.12 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.13 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion. Correction is limited to replacement of sealers.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure or fail in any manner previously defined.
   1. Submit warranty in writing signed by the Contractor, and installer.

PART 2 PRODUCTS

2.01 GENERAL

A. See schedule at the end of this section for additional information in regards to type and location of each product.

2.02 MATERIALS, GENERAL

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

2.03 SILICONE SEALANTS: FOR EXTERIOR JOINTS

A. Acceptable products; subject to compliance with specified requirements:
   1. GE Plastics; Product Silpruf Sealant: www.geplastics.com.
   2. Pecora Corporation; Product #895: www.pecora.com.
   3. Dow Corning Corp.; Product #795: www.dow.com

B. Substitutions: See Division 01 - Product Requirements.

C. Characteristics:
   1. Type: One-part medium modulus silicone rubber; meeting ASTM C920-95, Type S, Grade NS, Class 25.
   2. Colors: Custom colors as selected by Gardner Spencer Smith Tench and Jarbeau, PC

D. Related work: Refer to Expansion Joint Cover Assemblies section for expansion joint assemblies.

2.04 SILICONE SEALANTS: FOR WET AREAS

A. Acceptable products:
   1. GE Plastics; Product #SCS 1702 Silicone Sanitary Sealant: www.geplastics.com.
   2. Pecora Corporation; Product #898 Silicone Sanitary Sealant: www.pecora.com.

3. Dow Corning Corp.; Product #786 Mildew-Resistant Silicone Sealant: www.dow.com

B. Substitutions: See Division 01 - Product Requirements

C. Characteristics:
1. Type: One-part silicone rubber, mildew and stain resistant.
2. Color: White or off white.

2.05 POLYURETHANE SEALANT: FOR HORIZONTAL TRAFFIC-BEARING SURFACES

A. Acceptable products:
1. Tremco, Inc; Product THC-900/THC-901: www.tremcosealants.com.
2. Pecora Corp.; Product Urexpan NR-200: www.pecora.com.
3. A.C. Horn, Inc.; Product Daraseal-U.
4. Mameco International, Inc.; Product Vulkem 245/227.
5. Harry S. Peterson Co.; Product Iso-Flex 880 GB/881.
6. Sonneborn, ChemRex, Inc; Product Sonolastic SL-2: www.chemrex.com.

B. Substitutions: See Division 01 - Product Requirements

C. Characteristics:
1. Type: Two-component polyurethane sealant for horizontal traffic-bearing surface meeting ASTM C920-95, Type M, Grade P or NS, Class 25; self-leveling for flat surfaces and non-sag for sloped surfaces.
2. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's standard colors..

2.06 POLYURETHANE SEALANT: FOR WATERTIGHT JOINTS AND SEAMS

A. Acceptable Products:
1. Basis of Design: Pecora Corporation; Product DynaFlex SC: www.pecora.com.
2. A.C. Horn, Inc: www.tamms.com.
3. DAP, Inc: www.dap-inc.com.
4. Sonneborn, ChemRex, Inc: www.chemrex.com.
5. Tremco, Inc: www.tremcosealants.com.

B. Substitutions: See Division 01 - Product Requirements

C. Characteristics:
1. Type: One-part, polyurethane sealant meeting ASTM C-920-98, Type S, Grade NS, Class 12.5; non-sag, tamper resistant elastomeric joint sealant.
2. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's standard colors.

2.07 ACRYLIC-LATEX CAULKING COMPOUND: TYPICAL INTERIOR JOINTS AND SEAMS

A. Acceptable Products:
1. Pecora Corporation; Product AC-20 Acrylic-Latex Caulk: www.pecora.com.
2. Sonneborn, ChemRex, Inc; Product Sonolac: www.chemrex.com.
3. A.C. Horn, Inc.; Product Acrylic Latex Caulk.
4. DAP, Inc.; Product DAP Acrylic-Latex Caulk.
5. Tremco Inc.; Product Acrylic-Latex Caulk.

B. Substitutions: See Division 01 - Product Requirements

C. Characteristics:
1. Flexible, paintable, non-staining, non-bleeding acrylic emulsion.

2.08 ACOUSTICAL SEALANT: FOR CONCEALED LOCATIONS ONLY

A. Acceptable Products:
1. Acoustical Surfaces, Inc., SF-550.
2. Gold Bond Building Products/Div. National Gypsum Co., Sound Seal.

3. Protective Treatments, Inc., 808 Acoustical Sealant.
4. Tremco, Inc., Acoustical Sealant.
5. United States Gypsum Co., Sheetrock Acoustical Sealant.

B. Substitutions: See Division 01 - Product Requirements

C. Characteristics:
1. Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.

2.09 JOINT-SEALANT BACKING

A. General Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backing: ASTM C 1330, Type C (closed-cell material with a surface skin) O (open-cell material) B (bicellular material with surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.10 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

E. Tooling agent: Agent recommended by material manufacturer to ensure contact of material with inner joint faces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

C. With Installer present, examine joints indicated to receive joint sealants, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

E. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless material manufacturer's product data indicates that alkalinity does not interfere with bond and performance. Etch with 5% solution of muriatic acid; neutralize with dilute ammonia solution; rinse with clean water and allow to dry before caulking.

F. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   1. Concrete.
   2. Masonry.
   3. Unglazed surfaces of ceramic tile.

G. Remove laitance and form-release agents from concrete.

H. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   1. Metal.
   2. Glass.
   3. Porcelain enamel.
   4. Glazed surfaces of ceramic tile.

I. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on prior experience. Apply primer to comply with joint-sealant manufacturer’s written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

J. Masking Tape: Use masking tape where required to prevent contact of sealant with. adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker where joint backing is not used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

H. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

I. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

J. Do not allow material to overflow onto adjacent surfaces. Prevent staining of adjacent surfaces.

K. Interior joints: At interior joints and seams at abutting and adjacent materials, recess caulking compound 3/16" in joints wider than 1/4". At joints 1/4" or less in width, tool caulking flush.

L. Cure sealants and caulking compounds in accord with manufacturer's product data to obtain high early bond strength, internal cohesive strength and surface durability. Protect uncured surfaces from contamination and physical damage.

M. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint configuration per Figure SA in ASTM C 1193, unless otherwise indicated.
   4. Provide flush joint configuration where indicated per Figure SB in ASTM C 1193.
   5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
      a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

B. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect sealants until cured.

B. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion.

3.06 SCHEDULE

A. General: Unless otherwise indicated, joints around perimeter of frames, where indicated to be sealed, are to be sealed using sealer specified for the substrate adjacent to the frame.

B. Exterior joints in masonry, structural precast, metal panels, stucco, including control joints: Polyurethane sealant.

C. Interior joints in masonry, metal panels and stucco, including control joints: Polyurethane sealant.

D. Exterior and interior joints at perimeter of aluminum framing systems: Silicone sealants.

E. Exterior and interior joints of steel door framing: Silicone sealants for exterior joints and acrylic-latex sealant for interior joints.

F. Exterior and interior horizontal traffic-bearing joints, excluding ceramic tile joints: Polyurethane sealant for horizontal traffic-bearing surfaces.

G. Interior concealed bedding joints and thresholds: Silicone sealant for watertight joints and seams.

H. Interior tile joints: Polyurethane sealant for tile control and expansion joints.

I. Rated wall assemblies and firestopped joints: Firestop sealant as specified in Firestopping and Fire Resistive Joint Systems Sections.

J. Typical interior joints and seams at abutting and adjacent materials except as specified herein: Acrylic-latex caulking compound.

K. Interior joints in conjunction with vanities, fixtures and tile finishes: Silicone sealant for wet areas.

L. Interior joints and seams at abutting and adjacent materials in kitchen and food service areas, including joints around kitchen equipment: FDA approved sealant.

M. Acoustical sensitive joints and seams as defined on the drawings: Acoustical sealant for concealed locations only.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Accessories, including glazing, louvers, and matching panels.

1.02 RELATED REQUIREMENTS

A. Section 04 2200 - Concrete Unit Masonry: Adjacent construction.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

D. Section 09 2116 - Gypsum Board Assemblies: Adjacent construction.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI - American National Standards Institute.

B. ASCE - American Society of Civil Engineers.

C. HMMA - Hollow Metal Manufacturers Association.

D. NAAMM - National Association of Architectural Metal Manufacturers.

E. NFPA - National Fire Protection Association.

F. SDI - Steel Door Institute.

G. UL - Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames 2007 (R2011).

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2014.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2011.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2015.

F. ASTM C236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box; 1989 (Reapproved 1993).

G. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

H. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).

I. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames 2007.

J. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames 2013.

K. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2006.

L. NAAMM HMMA 862 - Guide Specifications for Commercial Security Hollow Metal Doors and Frames 2013.

M. NAAMM HMMA 865 - Guide Specifications for Sound Control Hollow Metal Doors and Frames 2013.

N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2016.

O. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2016.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2012.

Q. UL (DIR) - Online Certifications Directory current listings at database.ul.com.

R. UL 10B - Standard for Fire Tests of Door Assemblies Current Edition, Including All Revisions.

S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Certificates:
   1. Provide manufacturer's certification that products comply with referenced standards.
   2. Provide evidence of manufacturer's membership in the Steel Door Institute.

E. Door, frame, and hardware schedule in accordance with SDI 111.

F. Samples: Submit two samples of metal, 2 inch by 2 inch in size showing factory finishes, colors, and surface texture.

G. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

H. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
   1. Hollow metal distributor company who is a direct account of the manufacturer of the products furnished. In addition, that distributor must have in their regular employment an Architectural Hardware Consultant (AHC), a Certified Door Consultant (CDC) or an Architectural Openings Consultant (AOC), who will be available to consult with Gardner Spencer Smith Tench and Jarbeau, PC and Contractor regarding matters affecting the door and frame opening.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes installation requirements.

C. Quality Standard: Comply with SDI 100.

D. Manufacturer Qualifications: Provide all products from a single manufacturer who is a member of the Steel Door Institute.

E. Labeled Assemblies: At all locations where fire-rated door and frame assemblies are required , provide assemblies which comply with NFPA 80 and have been tested and labeled in accordance with ASTM E 152 by agency acceptable to governing authorities

F. Allowable erection tolerances:
   1. Variation from specified clearances: +/- 1/32".
   2. Variation in face alignment, pairs of doors: +/- 1/16".
   3. Variation in face alignment between door and frame: 1/8" maximum.

G. Performance criteria:
   1. Physical endurance: Comply with performance level for specified grade classification in accord with ANSI/SDI-100-03 and ANSI A250.4-94 for doors and hardware reinforcing, ANSI A250.5-94 for frames and anchors.
   2. Finish: Comply with standard performance criteria of ANSI A224.1-90 for primed steel surfaces.
   3. Thermal performance: Minimum aged value of U = 0.10 (R = 10.2) or better, apparent thermal performance in accord with SDI 113.
   4. Air infiltration: Maximum 1.25 cfm/1.f. at 1.567 psi (25 mph) in accord with SDI-116.
   5. Acoustical performance: STC of 25 or better in accord with SDI-114 and ASTM E90-97.

H. Coordination: Transmit copy of final shop drawings to wood door manufacturer to allow prefitting of wood doors to steel frames.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   1. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.

B. All doors and frames shall be stored vertically under cover.

C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

D. The units shall be placed on at least 4" high wood sills or in a manner that will prevent rust or damage.

E. Provide a 1/4" space between the doors to promote air circulation.

F. If the shipping wrap on the door becomes wet, it must be removed immediately.

G. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Products of the following SDI manufacturers, provided they comply with the requirements of the contract documents, will be among those considered acceptable:
   1. Amweld Building Products, Inc: www.amweld.com.
   2. Ceco Door Products: www.cecodoor.com.
   3. Curries Company: www.curries.com.
   4. Steelcraft Manufacturing Company: www.steelcraft.com.
   5. Windsor Republic Doors: www.republicdoor.com.

B. Substitutions: See Division 01 - Product Requirements.

2.02 DOORS AND FRAMES

A. Fabrication standard: Except for more stringent requirements specified, comply with ANSI/SDI-100-91, including performance levels as referenced.

B. Steel:
   1. Interior doors and frames: Fabricate of cold-rolled steel sheet meeting ASTM A366-96. For doors scheduled as galvanized or galvannealed steel sheet meeting ASTM A653-96, Designation A60 or G60; wipe coat not acceptable.
   2. All exterior, kitchen, dishwashing and serving line doors and frames: Fabricate of commercial quality, hot-dipped, galvanized or galvannealed steel sheet meeting ASTM A653-96, Designation A60 or G60; wipe coat not acceptable.

C. Finish for steel: Prime painted steel surfaces in compliance with ANSI A224.1-90.
   1. Interior doors and frames: One coat of manufacturer's standard rust-inhibitive primer.
   2. Exterior doors and frame: One coat of manufacturer's standard rust-inhibitive primer after chemical treatment of galvanized surface for paint adhesion.

D. Door classification:
   1. Standard interior hollow metal doors: Grade III, 16 ga., Extra Heavy Duty, Model One with edge seams, 1-3/4" thickness.
   2. Label fire-resistive composite metal doors: Grade III, 16 ga., Extra Heavy Duty, Model One with edge seams, 1-3/4" thickness, with mineral fiberboard core for all ratings over 20 minutes.
   3. Exterior Insulated composite metal doors: Grade III, 16 ga., Extra Heavy Duty, Model One with edge seams, 1-3/4" thickness, with polystyrene core.

E. Door characteristics:
   1. Edge bevel: Vertical edges beveled 1/8" in 2"; double-acting doors rounded on 2-1/8" radius. Non-handed door blanks with filler plates are not acceptable.
   2. Top and bottom edges: Flush, welded, minimum 18 ga. steel. Provide weep holes in bottom edge of exterior doors.
   3. Join door edges by continuous weld extending the full height of door. Grind, fill and dress welds smooth to make invisible and provide smooth flush surface.
   4. Astragals: Split type, 12 ga., material. Fire-rated "B" and "C" labeled doors shall be of type not requiring astragals to obtain rating.

F. Frame construction including sidelights and borrowed lite frames:
   1. Welded frames: 14 ga., with backbend returns, setup arc welded, with all joints, including face, flange and throat, full welded, dressed and ground smooth; no mechanical interlocking allowed. Provide welded frames with temporary spreaders during shipping, storage and erection.
   2. Transom bars and mullions: Shop fabricate from same material as door frames, setup arc welded, with all joints, including face, flange and throat, full welded, dressed and ground smooth; no mechanical interlocking allowed. Fabricate in largest size sections allowed by shipping and installation restrictions. Field joints shall occur only as indicated on approved shop drawings.
   3. Machine door frames for hardware scheduled for installation on that frame. Filler plates installed at unused openings will not be acceptable.
   4. Mortar guards: Provide properly sized frame mortar guards at hardware locations.
   5. Joints:
      a. Dress welded joints and ground smooth, indistinguishable in complete work.
      b. Make non-welded connections with tight fitting, closed joints.
      c. Make joints with aligned faces and arrises.

G. Frame anchors:
   1. Wall anchors for frame attachment to masonry construction: Adjustable, flat, minimum 18 ga. corrugated or perforated, T-shaped steel anchors with leg not less than 2" wide by 10" long. Provide one anchor per jamb for each 2'-0" of height or fraction thereof. Anchors for fire-rated frames shall be labeled type.

2. Wall anchors for frame attachment to drywall partitions: Manufacturer's standard adjustable type for attachment to studs. Provide one anchor per jamb for each 2'-0" of height or fraction thereof. Anchors for fire-rated frames shall be labeled type.
3. Typical floor anchors: Provide frames with minimum 18 ga. anchors for attachment to floor. For wall conditions that do not allow for the use of a floor anchor, provide an additional jamb anchor. Anchors for fire-rated frames shall be labeled type.
4. In-place masonry or concrete: 3/8" countersunk, flat head, stove bolts in expansion shields, spaced 6" maximum from top and bottom of frame and at 2'-0" o.c., maximum, between. Anchors for fire-rated frames shall be labeled type.

H. Applied stops: Formed, 20 ga. steel with mitered corners. Attach using countersunk oval head machine screws at 1'-0" o.c., maximum.

I. Preparation for hardware and anchors:
1. Reinforcement: Reinforce components for hardware installation in accord with ANSI/SDI-100-91.
2. Punch single leaf frames to receive three silencers; double leaf frames to receive two silencers per leaf, at head. Protect holes from grout.
3. Factory-prepared hardware locations shall be in accord with ANSI/SDI 100-91 ANSI/SDI 107.
4. Provide grout shields where frames in masonry walls are cut or drilled.
5. Install hardware reinforcement and anchors without distortions or blemishes on exposed surfaces.
6. Head shall have 12 gage door closer reinforcement sleeve, full width and length of head, whether or not closers are called for. No mutes or mute holes.

2.03 ACCESSORIES

A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed. As specified in Division 23 and or as shown in Drawings.

B. Glazing: Tempered As specified in Section 08 8000, factory installed.

C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

D. Astragals for Double Doors: Specified in Section 08 7100.

E. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.

F. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.04 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

B. Remove welded-in shipping spreaders installed at factory.

C. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
   1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
   3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

D. Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80, NFPA 257 and UL 9.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Install door hardware as specified in Section 08 7100.

F. Comply with glazing installation requirements of Section 08 8000.

G. Coordinate installation of electrical connections to electrical hardware items.

H. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 STEEL FRAMES

A. General:
   1. Install hollow metal frames in accord with ANSI/SDI 100-03 and SDI 105-92, approved shop drawings and product data.
   2. Clearance between frame and interfacing wall surfaces shall be 1/16" maximum.
   3. Shimming of door hinges is not an acceptable correction of door frames installed out of erection tolerance.

B. Welded frames:
   1. Set welded frames in position prior to beginning partitions work. Brace frames until permanent anchors are set.
   2. Set anchors for frames as work progresses. Install anchors at hinge and strike levels. Fully grout frames in masonry walls as specified in Concrete Unit Masonry section.
   3. Remove temporary braces and spreaders after wall construction is complete.
   4. Install welded frames in prepared openings in concrete and masonry walls using countersunk bolts and expansion shields. Fully grout in place.
   5. Solidly pack mineral-fiber insulation behind frames in metal-stud partitions.
   6. Weld field splices in borrowed lite frames and grind smooth.
   7. Fire-rated frame: Install in accord with requirements of NFPA No. 80-92 and No. 105-93.

3.06 STEEL DOORS

A. Install hollow metal doors in frames, using hardware specified in Finish Hardware section. Shimming of door hinges is not an acceptable repair of warped doors or door frames out of erection tolerances.

B. Edge clearances at doors:
   1. Between door and frame, at head and jambs: 1/8".
   2. At meeting edges of pairs of doors and at mullions: 1/8" to 1/4" (1/8" for fire-rated doors).
   3. At transom panels, without transom bars: 1/8".
   4. At sills without thresholds: 3/8" maximum above finish floor.
   5. At sills with thresholds: 3/8" maximum above top of threshold.
   6. Between face of door and door stop: 1/16".

C. Fire-rated doors: Install in accord with requirements of NFPA No. 80-99 and No. SDI 105-92.

3.07 ADJUSTING AND CLEANING

A. Adjust for smooth and balanced door movement.

B. Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, or otherwise unacceptable.

C. Clean grout and other bonding material off standard steel doors and frames immediately after installation.

D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

E. Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire rated and non-rated.

B. Shop priming or factory finishing flush wood doors.

C. Factory fitting flush wood doors to frames and factory machining for hardware.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. ASTM E413 - Classification for Rating Sound Insulation 2010.

B. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).

C. AWI (QCP) - Quality Certification Program Current Edition.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

E. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

F. ICC (IBC) - International Building Code; 2012.

G. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

H. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2016.

I. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

J. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

K. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2013.

L. WI (CCP) - Certified Compliance Program (CCP) Current Edition.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
   1. Indicate dimensions and locations of mortises and holes for hardware.
   2. Indicate dimensions and locations of cutouts.
   3. Indicate requirements for veneer matching.
   4. Indicate doors to be factory finished and finish requirements.
   5. Indicate fire ratings for fire doors.

D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
2. Louver blade and frame sections, 6 inches long, for each material and finish specified.
3. Frames for light openings, 6 inches long, for each material, type, and finish required.

E. Samples: Submit two samples of door construction, 12 x 12 inch in size cut from top corner of door.

F. Samples: Submit two samples of door veneer, 12 x 12 inch in size illustrating wood grain, stain color, and sheen.

G. Manufacturer's Installation Instructions: Indicate special installation instructions.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

B. Allowable fabrication tolerances:
1. Overall dimension: +/- 1/16".
2. Width: +/- 1/32".
3. Maximum warp, bow, cup or twist: 1/4".
4. Squareness: Maximum 1/8" difference in diagonal measurement.
5. Hardware locations: -0", +1/32".

C. Allowable erection tolerances:
1. Variation from specified clearances: +1/32", -0".
2. Maximum variation in edge alignment, pairs of doors: 1/16".

D. Allowable color and grain variation: Doors for natural finish shall be selected for uniformity in color and grain. Joints in face veneers shall be inconspicuous. Adjacent doors and doors viewed together shall have similar color and grain.

E. Labels:
1. On top edge, provide each door with a label which identifies manufacturer, trade association of which he is a member, grade and type of door or industry standard with which it complies.
2. Fire-rated doors:
   a. Fire-rated doors shall bear label of testing and approval by independent Testing Agency, having been tested in accord with NFPA 252 for ratings indicated. Doors to be Positive pressure tested UL10C and Category A edge sealing where required. Permanently attached label at eye level to hinge stile of each fire-rated door.
   b. Fire-rated doors shall provide rating without the use of salt-treated wood, or manufacturer shall provide certification that treated wood is non-hygroscopic and will warrant door against failure or discoloration of face veneer and door finish.
   c. Do not paint over labels.
3. All flush doors shall be the products of one manufacturer.

F. Installed Fire Rated Door and Transom Panel Assembly: Conform to {\rs\#1} for fire-rating as indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

D. Do not walk or stack other materials on top of stacked doors. Do not drag doors across each other.

1.07 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

B. Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.08 WARRANTY

A. See Division 01 - Closeout Submittals for additional warranty requirements.

B. Special Warranty: Manufacturer's standard form, signed by manufacturer. Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
   1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   2. Warranty shall be in effect during Ihe following period of time from date of Substantial Completion:
      a. Solid-Core Interior Doors: Life of installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:

B. Staved Lumber Core veneer doors:
   1. Basis of Design; Masonite Architectural: www.architectural.masonite.com.
   2. ABS Manufacturing; Product American Series Flush Doors: www.doormerica.com.
   3. Algoma Hardwoods, Inc; Product Novodor.
   4. Graham Manufacturing Co./Essex Industries, Inc; Product GPC Series.
   5. Oshkosh Architectural Door Co., Classic Architectural Door; Product GP Series: www.oshkosh.com.
   6. Mohawk Flush Doors, Inc; Product Custom Grade: www.mohawkdoors.com.

C. Mineral core fire-rated veneer doors:
   1. Basis of Design; Masonite Architectural: www.architectural.masonite.com.
   2. ABS Manufacturing; Product American Series Flush Doors: www.doormerica.com.
   3. Eggers Industries; Product FireGuard Plus: www.eggersindustries.com.
   4. Marshfield DoorSystems, Inc; Product Signature Series Mineral Core Door: www.marshfielddoors.com. (formerly Weyerhaeuser Door Division)
   5. Algoma Hardwoods, Inc; Product Superfire Door System.
   6. Graham Manufacturing Co./Essex Industries, Inc; Product GFM Series.
   7. Oshkosh Architectural Door Co., Classic Architectural Door; Product GF Series: www.oshkosh.com.
   8. Mohawk Flush Doors, Inc; Product Custom Grade: www.mohawkdoors.com

D. Substitutions: See Division 01 - Product Requirements.

2.02 DOORS

A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Level: Premium Grade with A grade veneer, in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1300.
   2. Wood Veneer Faced Doors: 5-ply or 7-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Wood veneer facing for field transparent finish as indicated on drawings.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type Kiln Dried staved lumber core (SLC), plies and faces as indicated above. Core to be one species per core. Cores are to be finger jointed and glued with type II water resistant adhesives and machined to a smooth consistent thickness.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
   1. Fire-Rated Doors: Comply with the following requirements:
      a. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
      b. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as follows:
         1) 5-inch top-rail blocking.
         2) 5-inch bottom-rail blocking, in doors indicated to have protection plates.
         3) 5-inch midrail blocking, in doors indicated to have armor plates.
         4) 5-inch midrail blocking, in doors indicated to have exit devices.
      c. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile matching face veneer, and laminated backing at hinge stiles for improved screw-holding capability and split resistance. Provide Category seals as required for UL-IOC and UL-1784 compliance.
      d. Pairs: Provide fire-rated pairs with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Match Existing, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face; unless otherwise indicated.
   1. Vertical Edges: Same species as face veneer.
   2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.
      a. Assembly of Veneer Leaves on Door Faces: Center balance match.
   3. Room Match: Match door faces within each separate room or area of building. Corridor door faces do not need to match where they are separated by 10 feet or more.

2.05 ACCESSORIES

A. Glazing for Doors: As specified in Section 08 8000.

B. Glazing Stops: Rolled steel channel shape, butted corners; prepared for countersink style tamper proof screws.
   1. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard frame formed of 0.0478-inch-thick, cold-rolled steel sheet; factory primed and approved for use in doors of fire rating indicated,

2.06 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Provide solid blocks at lock edge for hardware reinforcement.
   1. Provide solid blocking for other throughbolted hardware.

D. Fit door edge trim to edge of stiles after applying veneer facing.

E. Vertical Exposed Edge of Stiles - Veneer Faces: Of same species as veneer facing.

F. Fit door edge trim to edge of stiles after applying veneer facing.

G. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

H. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

I. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Factory finish doors in accordance with specified quality standard:
   1. Stain Finish: Espresso.
   2. Transparent Finish: Transparent conversion varnish, Premium quality, satin gloss sheen.

B. Seal door top and bottom edge with color sealer to match door facing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Trim door height by cutting bottom edges to a maximum of 3/4 inch (19 mm).
   1. Trim fire door height at bottom edge only, in accordance with fire rating requirements.

D. Use machine tools to cut or drill for hardware.

E. Coordinate installation of doors with installation of frames and hardware.

F. Coordinate installation of glazing.

G. Install door louvers plumb and level.

3.03 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

C. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.

D. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

C. Replace doors that are damaged or do not comply with requirements. Doors with minor scrapes and scratches may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.

1.02 RELATED REQUIREMENTS

A. Section 042200 - Concrete Unit Masonry: Adjacent construction for recessed frames.

B. Section 087100 - Door Hardware: Door cylinders.

C. Section 092116 - Gypsum Board Assemblies: Adjacent construction for recessed frames.

D. Section 09 9000 - Painting and Coating: Field paint finish.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

C. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2014.

D. ITS (DIR) - Directory of Listed Products current edition.

E. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Manufacturer's Installation Instructions: Indicate installation requirements.

E. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

C. Source Limitations: Obtain doors and frames through one source from a single manufacturer.

D. Size Variations: Obtain Gardner Spencer Smith Tench and Jarbeau, PC's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Fire-Rated Ceiling-Mounted Units: Attic Access
   1. Ceiling Fire-Rating: 1 hour.
   2. Material: Steel.
   3. Size: 22 inch by 22 inch.
   4. Door/Panel: Hinged, standard duty, with self-closing mechanism.
   5. Recessed hand-operated turn handle.

2.02 MANUFACTURERS

A. Wall and Ceiling Access Doors:
   1. Acudor Products Inc: www.acudor.com.
   2. J. L. Industries, Inc.: www.jlindustries.com.
   3. Karp Associates, Inc: www.karpinc.com.
   4. Larsen's Manufacturing Company: www.larsensmfg.com.
   5. Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com.
   6. Nystrom Building Products Co.:

B. Substitutions: See Division 01 - Product Requirements.

2.03 ACCESS DOORS AND PANELS

A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.

B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.
   1. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

2.04 MATERIALS

A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M.

B. Cold-Rolled Steel Sheets: ASTM A366/A366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M. Electrolytic zinc-coated steel sheet, complying with ASTM A59l/A591M, Class C coating, may be substituted at fabricator's option.

2.05 ACCESS DOORS AND FRAMES

A. Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.
   1. Locations: Gypsum board ceiling surfaces.
   2. Door: Minimum 0.060-inch- thick sheet metal, set flush with exposed face flange of frame.
   3. Frame: Minimum 0.060-inch- thick sheet metal with I-inch- wide, surface-mounted trim.
   4. Hinges: Spring-loaded concealed pin type.
   5. Latch: Screwdriver-operated cam latch.

2.06 FABRICATION

A. General: Provide access door assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Steel Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
   1. Exposed Flanges: Nominal 1 to 1-1/2 inches wide around perimeter of frame.
   2. Provide mounting holes in frames to attach frames to metal framing in drywall construction.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.07 STEEL FINISHES

A. Surface Preparation: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements of SSPC-SP 3, "Power Tool Cleaning" for surface-preparation specifications of installed metal fabrications.

B. Apply shop primer to uncoated surfaces of metal fabrications. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

2.08 PAINT

A. Shop Primers: Provide primers that comply with Division 9 Section "Painting."

B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum curtainwall system.

C. Aluminum doors and frames.

D. Weatherstripping.

E. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 07 2610: Sealing framing to weather barrier installed on adjacent construction.

B. Section 07 6500 - Flexible Flashing: Sealing perimeter between frames and adjacent construction.

C. Section 07 8400 - Firestopping: Firestop at system junction with structure.

D. Section 07 9005: Sealing joints between frames and adjacent construction.

E. Section 07 9005: Perimeter sealant and back-up materials.

F. Section 08 7100: Hardware items other than specified in this section.

G. Section 08 8000 - Glazing: Glass and glazing accessories.

H. Section 09 9000 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. AA DAF-45 - Designation System for Aluminum Finishes; The Aluminum Association, Inc.; 2003.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.

C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.

D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.

E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures 2010, with 2013 Supplements and Errata.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.

H. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.

J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 PERFORMANCE REQUIREMENTS

A. Deflection in plane of wall: Not greater than that which would reduce glass edge clearance to 25 percent of design dimension or 1/8 inch, whichever is greater, or that which would reduce glass bite to 75 percent of design dimension.
   1. Design system to withstand 150 percent of design wind load with no failure or permanent deformation greater then 0.2 percent of span.

B. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
   1. Structural loads.
   2. Thermal movements.
   3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
   4. Dimensional tolerances of building frame and other adjacent construction.
   5. Failure includes the following:
      a. Deflection exceeding specified limits.
      b. Thermal stresses transferred to building structure.
      c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
      d. Glazing-to-glazing contact.
      e. Noise or vibration created by wind and thermal and structural movements.
      f. Loosening or weakening of fasteners, attachments, and other components.
      g. Sealant failure.
      h. Failure of operating units to function properly.

C. Structural Sealant: Capable of withstanding tensile and shear stresses imposed by aluminum-framed systems without failing adhesively or cohesively. Provide sealant that fails cohesive before sealant releases from substrate when tested for adhesive compatibility with each substrate and joint condition required.
   1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
   2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate because sealant-to-substrate bond strength exceeds sealant’s internal strength.

D. Structural-Sealant Joints: Designed to produce tensile or shear stress in structural-sealant joints of less than 20 psi (138 kPa).

E. Structural Performance: Completed systems shall withstand positive and negative wind pressure loading complying with governing authorities and particular code; loads acting perpendicular to wall plane. Test per ASTM E330, Procedure A.
   1. Design pressure loading:
      a. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
      b. No glass breakage.
      c. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
      d. When tested at positive and negative wind-load design pressure, systems do not evidence deflection exceeding specified limits.
      e. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress,

and permanent deformation of main framing members exceeding 0.2 percent of span.

f. Test Durations: As required by design wind velocity but not less than 10 seconds.

F. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss. Submit certification to the below from a professional structural engineer licensed in Georgia to Gardner Spencer Smith Tench and Jarbeau, PC. for file.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
   a. Test High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
   b. Test Low Exterior Ambient-Air Temperature: 0 deg F.
   c. Test Interior Ambient-Air Temperature: 75 degF.

G. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at minimum static-air-pressure difference of 6.24 lbf/sq. ft..

H. Water Penetration Under Static Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

I. Water Penetration Under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

1. Maximum Water Leakage: No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

J. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.

K. Average Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having average U-factor of not more than 0.69 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.

1.06 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Substitutions: {CH#121555}.

C. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.

D. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Include details of provisions for system expansion and contraction and for draining moisture occuring within the system to the exterior.
3. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.

E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

F. Samples: Submit two samples 6 x 6 inches in size illustrating finished aluminum surface, glass, glazing materials.

G. Fabrication Sample: Of each vertical-to-horizontal intersection of systems, made from 12-inch lengths of full-size components and showing details of the following:
   1. Joinery.
   2. Sealant adhesion.
   3. Anchorage.
   4. Expansion provisions.
   5. Glazing.
   6. Flashing and drainage.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Qualification Data: For Installer.

J. Field quality-control test and inspection reports.

K. Maintenance Data: For aluminum-formed systems to include in maintenance manuals.

L. Glass manufacturer's approval: Indicate on shop drawings, or by letter prior to submission of shop drawings, that selected glass manufacturer's have reviewed and approved details, including glass bite, clearances, system weepage, air circulation around interior window treatments, shading by exterior building components and glazing methods.

M. Warranty: Submit manufacturer warranty and ensure forms have been completed in Union County Commissioner's Office's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Single Source Requirements: Entrances and storefront systems shall be products of a single manufacturer or acceptable to storefront manufacturer. Storefront framing system receiving window unit installation shall be acceptable to aluminum window manufacturer.

B. Installer Qualifications: Capable of assuming engineering responsibilities and performing work of this Section and who is acceptable to manufacturer with minimum three years of documented experience.
   1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer’s standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer’s standard assemblies.

C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
   1. Do not modify intended aesthetic effects, as judged solely by Gardner Spencer Smith Tench and Jarbeau, PC, except with Gardner Spencer Smith Tench and Jarbeau, PC's approval. If modifications are proposed, submit comprehensive explanatory data to Gardner Spencer Smith Tench and Jarbeau, PC for review.

D. Accessible Entrances: Comply with the U.S. Architectural & Transportation Barriers Compliance Boards’s “Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG).”

E. Structural-Sealant Glazing: Comply with recommendations in ASTM C 1401, “Guide for Structural Sealant Glazing.”

F. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1.08 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.10 PROJECT CONDITIONS

A. Coordinate the work with installation of firestopping components or materials.

B. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on shop Drawings.

1.11 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

B. Protection: Protect aluminum surfaces from contact with lime, mortar, cement, acids and other harmful surfaces and from coreless handling, storage or machining.

1.12 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Basis of design Metal-Framed Storefronts and Doors: Kawneer Company, Inc; Product Tri-Fab 451UT: www.kawneer.com.
   2. Basis of design Metal-Framed Doors: Kawneer Company, Inc; Product 500 tuffline door entrances: www.kawneer.com.
   3. EFCO Corp.: www.efcocorp.com.
   4. Special-Lite, Inc: www.special-lite.com.
   5. TRACO: www.traco.com.
   6. Tubelite, Inc.: www.tubeliteinc.com.
   7. United States Aluminum: www.usalum.com.
   8. YKK Corp.: www.ykk.com.
   9. Wausau Window and Wall Systems: www.wausauwindow.com.

B. Substitutions: See Division 01 - Product Requirements.

2.02 COMPONENTS

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Metal-Framed Storefront System Framing Characteristics:
    a. Member sizes: 2" wide by minimum 4-1/2" deep.
    b. Construction: Flush glazed two-piece mullion & stop system for inside glazing.
    c. System construction: Screw spline two-piece snap together, or shear block tubular mullion.
    d. Glazing pocket depth: As required by glass manufacturer.
    e. Make provisions in framing for minimum edge clearance, nominal edge cover, and nominal pocket width for thickness and type of glazing.
    f. Design framing for panel removal from interior.
    g. Provide all required subframing, blocking, shims, and other items necessary for complete installation. Subframes and reinforcing members shall be of carbon steel with shop applied protective coating.
2. Curtainwall System Framing Characteristics:
    a. Member sizes: 2-1/2" wide by 7-1/2" deep, reinforced as required.
    b. Construction: Flush glazed tubular for outside glazing.
    c. System construction: Screw spline or shear block.
    d. Infill adapters: Manufacturer's standard for single glazing installations where indicated.
    e. Make provisions in framing for minimum edge clearance, nominal edge cover, and nominal pocket width for thickness and type of glazing.
    f. Design framing for panel removal from exterior.
    g. Provide all required subframing, blocking, shims, and other items necessary for complete installation. Subframes and reinforcing members shall be of carbon steel with shop applied protective coating.
3. Glazing Position: Front-set.
4. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
5. Finish: Class I natural anodized.
    a. Factory finish all surfaces that will be exposed in completed assemblies.

2.03 COMPONENTS

A. Sill flashing: Provide special shaped sill flashing at all exterior storefronts. Sill flashing shall match storefronts in material and finish. Sill flashing shall be continuous, set in storefront sealant and joints sealed as herein specified; form endams at terminations and corners.

B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
    1. Framing members for interior applications need not be thermally broken.
    2. Glazing Stops: Flush.

2.04 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

B. Sheet and Plate: ASTM B 209 (ASTM B 209M).
    1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
    2. Extruded Structural Pipe and Tubes: ASTM B 429.
    3. Structural Profiles: ASTM B 308/ B 308B.

C. Steel Reinforcement: With manufacturer’s standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
    1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
    2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.

3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.05 FRAMING SYSTEMS

A. Framing Members: Manufacturer’s standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   1. Construction: Framing members are composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance.

B. Brackets and Reinforcements: Manufacturer’s standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer’s standard corrosion-resistant, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
   2. Reinforce members as required to receive fasteners threads.
   3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/ A 153M requirements.

E. Flashing: Manufacturer’s standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.

F. Sill Flashing: Formed of minimum 0.062" thickness aluminum; matching storefront framing of type with interior end and rear legs turned up minimum 1/2" against framing member to form watertight gutter. Seal all aluminum to aluminum laps with sealant.

G. Framing System Gaskets and Sealants: Manufacturer’s standard recommended by manufacturer for joint type.

H. Design framing for panel removal from interior.

I. Trim and Closures: Provide exterior and interior trim and closure components in materials and finishes matching storefront framing for complete installation. Trim components shall be attached without use of exposed fasteners.

2.06 GLAZING SYSTEMS

A. Glazing: As specified in Section 08 8000 - Glazing.

B. Glazing Gaskets: Manufacturer’s standard compression types, replaceable, mold or extruded, that maintain uniform pressure and watertight seal.

C. Spacers and Setting Blocks: Manufacturer’s standard elastomeric types.

D. Bond-Breaker Tape: Manufacturer’s standard TFE-fluorocarbon or polyethylene material to which sealant will not develop adhesion.

E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type and as follows:
   1. Structural Sealant: ASTM C 1184, neutral-curing silicone formulation compatible with system components with which it comes in contact, specifically formatted and tested for use as structural sealant, and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
      a. Color: Gardner Spencer Smith Tench and Jarbeau, PC to select from manufacturer’s full range.
   2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; neutral-curing silicone formulation compatible with structural sealant and other systems

components with which it comes in contact; and recommended by structural- and weatherseal-sealant and aluminum-framed system manufacturers for this use.

a. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's full range.

2.07 DOORS

A. Doors: Manufacturer's standard glazed doors, for manual swing operation.
   1. Door Construction: 1-3/4 inch overall thickness, with minimum 0.125 inch thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie rods.
   2. Door Design: Wide stile; 5 inch nominal width.
      a. Accessible Doors: Smooth surface for width of door in area within 10 inches above floor or ground plane.
   3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
      a. Provide nonremovable glazing stops on outside of door.

B. Door Hardware: As specified in Division 08 Section "Door Hardware."

2.08 ACCESSORY MATERIALS

A. Insulating Materials: As specified at perimeter of aluminum-framed systems, as specified in Section 07 2100 - Thermal Insulation.

B. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 07 9005 - Joint Sealers.
   1. Storefront sealant shall be non-skinning type meeting AAMA 800-86.

C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos formulated for 30-mil thickness per coat.

D. Framing Anchors: Series 300 stainless steel, sizes as required to be structurally adequate to carry dead load, accommodate thermal movement, resist wind load specified herein, and withstand normal loads imposed by entry door operation.

E. Exposed-to-View Fasteners: Series 300 stainless steel or hardened aluminum flat-head, phillips head type in finish to match framing members.

2.09 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel.

C. Perimeter Sealant: Type as specified in Section 07 9005 - Joint Sealers.

D. Glass in Storefront System: As specified in Section 08 8000 - Glazing and as noted on the drawings.

E. Glass in Doors: Tempered and as specified in Section 08 8000 - Glazing and as noted on the drawings.

F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

G. Glazing Accessories: As specified in Section 08 8000 - Glazing.

2.10 FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

C. Class I Natural Anodized Finish: AAMA 611 AA-M10C22A31 Clear anodic coating not less than 0.7 mils thick.
   1. Color and Gloss: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's full range.
   2. All framing members shall be in the uniform color range of manufacturer's standard finish range, and the colors of all framing members within the same unit shall be identical. The fabricator shall carefully select framing materials from the manufacturer to comply with this criterion.
   3. Unexposed aluminum components: Mill finish.

D. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.11 FABRICATION

A. Reinforce components internally for door hardware and door operators.
   1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.
   2. At exterior doors, provide weather sweeps applied to door bottoms.

B. Hardware Installation: Factory install hardware to the greatest extent possible. Cut, drill, and tap for factory-installed hardware before applying finishes.

C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
   4. Physical and thermal isolation of glazing edge clearances.
   5. Provision for field replacement of glazing from exterior.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricated for flush glazing (without projecting stops).

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device (dutchman) to retain glazing in place while structural sealant cures.

F. Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.
   1. At exterior doors, provide compression weather stripping at fixed stops.

G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

H. Form aluminum shapes before finishing.

2.12 SOURCE QUALITY CONTROL

A. Structural-Sealant-Glazed Systems: Perform quality-control procedures complying with ASTM C 1401 recommendations including but not limited to, system material qualification procedures, sealant testing, and system fabrication reviews and checks.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Inserts and Anchorage:
   1. Furnish inserts and anchoring devices, which must be present in concrete on timely basis to avoid delay in the work. Set at locations indicated on approved shop drawings.
   2. Coordinate setting drawings, diagrams, templates and instructions for installation of concrete inserts, anchor bolts and miscellaneous items having integral anchors cast in concrete construction.

B. Anchor Locations: Verify location and alignment of preset anchors. Report deviations and proposed method for correction to Gardner Spencer Smith Tench and Jarbeau, PC prior to proceeding with installation.

3.03 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Protect aluminum in contact with masonry, steel, concrete or other dissimilar material from contact by neoprene gaskets or bituminous coating.

K. Install sill flashing at all exterior storefronts in accordance with written recommendations. Flashing shall extend continuous with joints lapped and sealed; set in full continuous bed of storefront sealant. Where possible, secure sill flashing at ends, otherwise, seal all penetrations through flashing.

L. Locate expansion mullions in accordance with manufacturer's recommendation, as indicated on approved shop drawings.

M. Install weep hole baffle with filter at weep holes. Install filter under 30% compression.

N. Verify during installation that storefront system allows water which enters the system to be collected in gutters and weeped to exterior. Ascertain that weep holes are open and that metal to metal joints are sealed.

O. Set thresholds in bed of sealant and secure.

P. Install hardware using templates provided.

Q. See Section 08 7100 - Door Hardware for hardware installation requirements.

R. Install glass and infill panels in accordance with Section 08 8000 - Glazing, using glazing method required to achieve performance criteria.

S. Install perimeter sealant in accordance with Section 07 9005 - Joint Sealers.

T. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

1. Caulk metal-to-metal internal storefront joints using storefront sealant.
2. Caulk perimeter of storefronts using medium modulus silicone sealant. Caulk both exterior and interior faces of storefront perimeter.

3.04 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:
   1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
   2. Alignment:
      a. Where surfaces abut in line, limit offset from true alignment to 1/6 inch.
      b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
   3. Diagonal Measurements: Limit differences between diagonal measurement to 1/8 inch.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

B. Test installed storefront for water leakage in accordance with AAMA 501.2 hose test.

C. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

D. Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take results for previously completed areas show compliance with requirements.
   1. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

E. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.

F. Additional testing and inspecting, at Contractor’s expense, will be preformed to determine compliance of replaced or additional work with specified requirements.

3.06 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

B. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturer’s written instructions.

C. For doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch measured to the leading door edge.

3.07 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Remove excess sealant by method acceptable to sealant manufacturer.

3.08 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED SECTIONS

A. Section 07 2100: Insulation fill around window units.

B. Section 07 2400.

C. Section 07 2610.

D. Section 07 9005: Sealant and back-up material.

E. Section 08 3313 - COILING COUNTER SHUTTERS: Glazed doors.

F. Section 08 1416: Glazed doors.

G. Section 08 4313 - Aluminum-Framed Storefronts.

1.03 REFERENCES

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2004.

C. ASTM C 1036 - Standard Specification for Flat Glass; 2001.

D. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.

E. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.

F. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.

G. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

1.04 PERFORMANCE REQUIREMENTS

A. Wind Loads: Comply with wind load criteria specified in Metal-Framed Storefronts section.

B. Thermal Insulating Units: Units shall comply with the requirements of ASTM E774-97 and be certified by Associated Laboratories, Inc., (ALI) or insulating Glass Certification Council (IGCC) for Class A.

C. Tinted Glass Types: Whether used in a monolithic state or as a lite of thermal insulating unit, shall each be the product of a single manufacturer.
   1. Basis of Color Design:
      a. PPG Solarban 60 on clear Low-E (3) Solargray Tinted or equal.
      b. Minimum 1/4" thickness except as otherwise indicated.
      c. Visible light transmittance for insulted unit: 35%.
      d. Thermal transmittance ("U" value) winter, night for insulated unit: 0.29.
      e. Thermal transmittance ("U" value) summer, day for insulated unit: 0.27.
      f. Shading coefficient for insulated unit: 0.33.

D. Glazing Materials: Whether in a monolithic state or as a lite of a thermal insulating unit, shall be heat treated where required by glass manufacturer's design calculations to resist stress caused by glass orientations, sizes and configurations, heat stress, inherent imperfections, wind loading, glazing conditions, temperature differential, inside window treatments or other conditions affecting breakage probability. Maximum allowable breakage probability at design

loads shall be eight lites per thousand for vertical glazing.

E. For heat-treated glass, orient lites with roll distortion parallel to head and sill members.

F. Tempered and laminated glazing materials shall comply with CPSC 16-CFR, Part 1201, Category II.

G. Tinted and spandrel glass types, whether used in a monolithic state or as a lite of a thermal insulating unit, shall each be the product of a single manufacturer.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements. Include technical data, storage and handling procedures and performance characteristics.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

D. Samples: Submit two samples 12 x 12 inch in size of glass units, showing coloration and design.

E. Certificates: Certify that products meet or exceed specified requirements.

F. Manufacturer's Certificate: Certify that sealed insulated glass meets or exceeds specified requirements.

G. Framing Manufacturer's Approval: Prior to submission of shop drawings, indicate by letter that an authorized representative of hollow metal frames and metal-framed storefront framing manufacturer has reviewed and approved details, including glass bite, clearances and glazing methods.

H. Calculations: Submit for Gardner Spencer Smith Tench and Jarbeau, PC's information only. Submit calculations prepared by glazing material manufacturer indicating recommendations for glass thickness and heat treating of glazing materials as a result of heat stress, building orientation, inside window treatments, shading by exterior building components or wind loading. Identify factors affecting breakage probability which have been taken into consideration and breakage probability anticipated by calculations.

I. Maintenance Data: Submit glazing material manufacturer's maintenance data for cleaning and care of each type of glazing material.

1.06 QUALITY ASSURANCE

A. Labeling: Label each piece of glass and glazing and mirrors with manufacturer's name, and the grade or quality of the material. Labels shall be intact before and after installation.
   1. Glazing shall bear manufacturer's label identifying type, quality and thickness of material. Labels for single thickness annealed float glass, if not available on each lite shall at least be factory applied to shipping crates. All other glazing materials shall be required to bear labels on each lite either temporary or permanent types as required by governing building codes or certification agency where specified.
   2. Tempered glass shall have permanent etched or ceramic fired identification on each unit indicating compliance with safety glazing standard. Identification shall be visible in completed installation and oriented in an inconspicuous corner.

B. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years documented experience.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for additional mock-up requirements.

B. Provide mockup of window unit including glass and air barrier and vapor retarder seal.

C. Locate where directed.

D. Mockup may remain as part of the Work.

1.08 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

B. Contractor, Gardner Spencer Smith Tench and Jarbeau, PC, storefront supplier and erector, a representative of glass manufacturer, a representative of sealant manufacturer and glazing subcontractor will be present.

C. Material submitted by Contractor, interfacing of glass and glazing and window wall work, dimensions and tolerances, sealant joint widths and depths and butt joint glazing will be reviewed.

1.09 DELIVERY, STORAGE, AND PROTECTION

A. Move no cases which have been partially unpacked. Unpack glazing materials in accord with manufacturer's product data for type of material being handled. Stack individual lites as recommended by manufacturer's product data.

B. Utilize rolling blocks to rotate glazing materials.

C. Handle insulating units without rotating, warping or cartwheeling units. Prevent damage to glazing material or edge seal.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.11 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

B. Provide a ten (10) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

C. Provide a ten (10) year warranty guaranteeing to correct failures in weathertightness signed by the installer and contractor. Failure is defined as water leakage through glazing assembly. Correction may include repair or replacement.

D. Provide a ten (10) year warranty to cover silver spoilage in mirrors.

E. Provide a two (2) year warranty to cover materials and labor to replace glazing damage for any reason other than natural disasters, vandalism or damage resulting from accident or abuse arising out of the Union County Commissioner's Office's operations.

F. All warranties shall commence on the Date of Substantial Completion of the Project.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS AND FABRICATORS

A. To maximum extent possible, provide domestically manufactured and fabricated glass, and provide glass from one manufacturer.

B. Types of glass specified or indicated shall be subject to compliance with specified requirements and manufactured or fabricated by one of the following:
   1. Basis of Design: Vitro Architectural Glass: www.vitroglasshub.com.
   2. ACH Glass/Versalux: www.versaluxglass.com
   3. AFG Industries, Inc: www.afgglass.com.
   4. Global Security Glazing: www.security-glazing.com.
   5. Pilkington North America: www.pilkington.com.

6. Viracon, Inc: www.viracon.com.

C. Substitutions: Refer to Division 01 - Product Requirements.

2.02 GLASS MATERIALS

A. General: Conform to ASTM C 1036, ASTM C 1048 and to ANSI Z97.1. Label factory cut panes.

B. Float Glass: Type I, (transparent glass flat), Class 1 (clear), Quality q3, (glazing select), minimum 1/4 inch thickness unless otherwise indicated or required.

C. Tinted Float Glass: Type I, Class 2 (tinted heat absorbing and light reducing), quality q3, color as selected by Gardner Spencer Smith Tench and Jarbeau, PC, minimum 1/4 inch thickness unless otherwise indicated or required.

D. Tempered Glass: Condition A, Type I or II, Class 1, Quality q3, Kind FT, match color of clear or tinted glass as applicable; fully thermal tempered, heat strengthening or chemical tempering is not permitted. Perform tempering by horizontal oscillating roller hearth or high speed roller hearth process. Do not permit fabrication processes leaving gripper or tong marks. Handle and size glass according to manufacturer's written instructions.

E. Clear Laminated Glass: 2 layers of 1/8 inch clear float glass with 0.030 inch thick high strength polyvinyl butyral laminating sheet. Edges of laminated glass shall be treated with Ardis 500, or equal, edge protection to prevent contact of laminating sheet with sealants.

F. Tinted Laminated Glass: One layer of 1/8 inch clear float glass and one layer of tinted glass to match other windows, with 0.030 inch thick high strength polyvinyl butyral laminating sheet. Edges of laminated glass shall be treated with Ardis 500, or equal, edge protection to prevent contact of laminating sheet with sealants.

G. Insulated Glass: Pre-assembled sealed lite units with dehydrated space between glass units, complying with ASTM E 774 for Class CBA units.

H. Low Emissivity Glass (Low E Glass): Provide units with thin metallic high-transmittance coating applied to the number 3 surface of the unit, unless otherwise indicated. The U-value for the IGU shall be no greater than 0.29, unless otherwise indicated.

I. Obscure Glass: Type II, Class 1, Form 3, Quality q7, patterned one side, pattern as indicated or selected.

2.03 GLASS SETTING MATERIALS

A. Setting Blocks: ASTM C 864, channel shape; having 1/4 inch internal depth, Shore A hardness of 80 to 90 Durometer. Blocks shall be a minimum 2 inch long. Block width shall be approximately 1/16 inch less than the full width of the rabbet. Block thickness shall be at least 3/16 inch, sized for rabbet depth as required.

B. Spacers: ASTM C 864, channel shape, with 1/4 inch internal depth, 3/32 inch flanges, web, 1/8 inch thick, one to 3 inches long. Spacers shall provide Shore A hardness of 40 to 50 Durometer.

C. Vinyl Glazing Channels: Profile compatible with framing system and designed to accommodate glass of specified thickness, light gray in color. Provide for dry glazing aluminum frames where indicated or permitted.

D. Glazing Tape: Poly-isobutylene based sealant tape, conforming to AAMA 804.1, with adhesive one side protected by temporary paper cover, Extru-Seal manufactured by Pecora Corp., No. 303 by Protective Treatments, Inc., or equal.

E. Spring Steel Spacers: Galvanized steel wire or strip designed to position glazing in channel or rabbet sash with stops.

F. Glazing Clips: Galvanized steel spring wire designed to hold glass in position in rabbet sash without stops.

G. Glazing Points (Sprigs): Pure zinc stock, thin, flat, triangular or diamond-shaped pieces, 1/4 inch minimum size.

H. Glazing Sealants for Metal Sash: GE Silicones Silglaze II 2800, GE Silicones Silpruf, GE Silicones 1200 Silicone, and Dow Corning 999A. Polybutylene, oleoresinous, asphalt, and oil base sealants are not permitted. Provide sealant of same color as structural silicone sealant unless otherwise required.

I. Glazing Compound for Wood Sash: Acrylic latex caulk by Tremco. Provide for bedding and caulking glass in wood frames.

J. Glazing Compounds and Sealants for Thermoplastic: Provide silicone, butyl, or polysulfide glazing compound.

K. Mirror Setting Materials: Manufactured by Palmer Products Corporation, or equal, for installation of mirrors, and as follows:
   1. Mirror backing paint: Mirro-Bac Paint, or equal, formulated to protect mirror silvering.
   2. Mirror bond coat: Mirro-Mastic Bond, or equal, formulated to isolate deleterious backing materials from mastic and mirror.
   3. Mirror mastic: Mirro-Mastic, or equal, formulated for adhering mirrors and glass to substrates.

2.04 FLAT GLASS MATERIALS

A. Clear Float Glass (Type G1): Clear, fully tempered for interior applications.
   1. 1/4" thick complying with ASTM C1048-92. Glass for butt-joint glazing shall be free of tong marks and surface defects on exposed edges.

B. Tinted Float Glass (Type G2): Tinted (Match Existing), fully tempered for exterior doors.

C. Laminated Safety Glass (Type G3): Clear; fully tempered see Section 08 1416 - Flush Wood Doors for glazing for interior door lites.
   1. Glass Acceptable Manufacturers:
      a. AGC InterEdge Technologies; Product: PyroEdge 20: www.us.agc.com.
      b. Safety and Fire-Rated Technology International (SAFTI); Product: SuperLite I: www.safti.com.
      c. Technical Glass Products/J.R Four, Ltd.; Product: Fireglass 20: www.fireglass.com.
      d. Vetrotech Saint-Gobain; Product: SGG Pyroswiss US: www.vetrotech.com.
   2. Thickness: 1/4" minimum.
   3. Fire Rating: 20/30 minutes without hose stream.
   4. Impact Safety Performance: ANSI Z97.1 and CPSC 16CFR1201
      a. STC Rating: Up to 44dB
   5. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
   6. Comply with 16 CFR 1201 test requirements for Category II.

2.05 SEALED INSULATING GLASS MATERIALS

A. Tinted Insulated Unit (Type IG1): Tinted (Match Existing) float glass, at exterior windows unless otherwise indicated. Fully tempered glass for both inboard and outboard lites in units.

2.06 GLAZING COMPOUNDS

A. Manufacturers:
   1. Dow Corning Corp; Product #795 Silicone Building Sealant: www.dowcorning.com.
   2. GE Silicones; Product Ultraglaz SSG4000: www.gesilicones.com.
   3. Tremco, Inc; Product Spectrem II: www.tremcosealants.com.
   4. Substitutions: Refer to Division 01 - Product Requirements.

B. Silicone Sealant : Single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining; cured Shore A hardness of 15 to 25; color as

selected.

C. Provide primers as required by adhesion testing, backer rod and accessories acceptable to sealant manufacturer.

2.07 GLAZING ACCESSORIES

A. Manufacturers:
   1. Pecora Corp: www.pecora.com.
   2. Saint-Gobain: www.plastics.saint-gobain.com.
   3. Tremco, Inc: www.tremcosealants.com.
   4. Substitutions: Refer to Division 01 - Product Requirements.

B. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

D. Interior Hollow Metal Partition Glazing: Manufacturer's standard resilient glazing beads.

E. Glazing Gaskets: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; black color.

F. Glazing Clips: Manufacturer's standard type.

G. Muntin Spacer Bars: Manufacturer's rectangular aluminum spacer bars factory-installed within air space of sealed insulated glazing units, simulating divided lites in patterns indicated on drawings.
   1. Grille members shall be 5/8" face width by depth of air space in finish rnatching storefront system at locations coinciding with applied-on muntins.

H. Glazing Gaskets for Metal Framed Skylights: Glazing assembly manufacturer's standard extruded or molded neoprene, Ethylene Propylene Diene Monomer (EPDM) or silicone rubber gaskets as required or recommended for system specified.

I. Fire-Rated Glazing Accessories:
   1. Fire-Rated Glazing Frames: Fire-rated glazing manufacturer's fire tested frames used with glazing assemblies for required ratings. Furnish for installation in fire-rated doors and hollow metal work in wall openings as reqUired by manufacturer's fire tested assemblies.
   2. Glazing Gaskets and Tapes: Closed cell polyvinyl chloride (PVC) foam tape, EPDM tape, ceramic glazing tape or other flame resistant gasket material as recommended by fire-rated glazing manufacturer and fire tested with glazing assemblies for specified ratings.
   3. Setting Blocks: Neoprene, EPDM or calcium silicate setting blocks as recommended by fire-rated glazing manufacturer and fire tested with glazing assemblies for specified ratings.
   4. Cleaners, Primers and Sealers: Types as recommended by glazing and gaskets manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

C. Verify compliance with the following requirements prior to beginning glazing work:
   1. That framing is anchored in position, plumb and square within 1/8" of normal dimensions indicated.
   2. That fastener heads, and other projections are removed from glazing rabbets.

3. That corners and fabrication intersections are sealed and framing is weathertight.
4. That rabbets at sills weep to outside and rabbets are sufficient depth and width to receive glazing material and provide the required bite of the glazing material.
5. That surfaces to receive zipper type gaskets comply with tolerances required by gasket manufacturer.
6. That hollow metal frames have received paint finish in accord with Painting section.

3.02 PERFORMANCE REQUIREMENTS

A. Install glazing materials to obtain air-tight and water-tight installation and to withstand normal temperature changes and wind loads without failure.

B. Protect glazing material faces and edges during handling and installation.

C. Size glazing materials for each opening to ensure correct bite on glazing material, without imposing strain, in accordance with manufacturer's product data.

D. Maintain minimum bed clearance between glazing material and sash of 1/8", both sides, except where greater clearances is required by either glazing material or framing manufacturer.

3.03 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

F. Inspect glazing material prior to installation. Eliminate lites having face or edge damage.

G. of tempered and insulating glass shall not be cut or otherwise altered in the field.

3.04 GLAZING PROCEDURES

A. General: Install glazing materials in accordance with manufacturer's written product data and applicable standards, except where more stringent requirements are specified.

B. Setting Blocks: Install setting blocks for all glazing materials over six square feet in area. Install at sill rabbet located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Size setting blocks in proportion to glass weight; minimum 4" in length.

C. Shims: Shim all lites over 100 united inches, inboard and outboard, on all sides using continuous shims, except where gaskets accomplish shimming; unless otherwise specified.

D. Edge Blocks: Provide edge blocks at vertical jambs to prevent lateral movement of glass. Provide edge blocks at 3" minimum in length. Maintain 1/8" clearance between edge of glass and edge block.

E. Interior Hollow Metal Glazing: Glaze using specified glazing beads in accordance with manufacturer's instructions.

F. Fire-Rated Glazing: Comply with glazing manufacturer's instructions and NFPA 80 requirements for installation in doors and windows or framed openings.
   1. Install glazing materials of ratings scheduled for fire-rated doors and framed openings.
   2. Install glazing so that permanent labels are positioned in an inconspicuous corner for visual inspection by building official.

G. Exterior Hollow Metal Window Channel Glazing:
   1. Glaze using specified glazing tape inboard and outboard.
   2. Shim lites over 75 united inches, inboard and outboard, on all sides in accordance with glazing tape manufacturer's ecommendations.

3. Cut tape to size to allow for tight butted joints; install to horizontal members first, then to verticals. Install tape to exterior stops so that top edge is approximately 1/8" below sight line of stop for sealant cap bead installation.
4. Remove backing paper from tape prior to selling glass; center glazing in rabbet and pressed firm against tape. Apply heal bead sealant to interior side for minimum 3/16" bite and positive bond with metal framing.
5. Install glazing tape to interior glass edges so that top edge will be flush with sight line of interior stop when installed. Install stops to framing and secure in position.
6. Apply cap bead sealant to exterior side of glass over edge of glazing tape full perimeter of frame.

H. Glazing Sealant Installation: Comply with applicable provisions of Joint Sealers section. Prevent filling of weep holes with sealant.

3.05 MANUFACTURER'S FIELD SERVICES

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.06 ALLOWABLE TOLERANCES

A. Mirrors:
1. Fabrication tolerances:
a. Variation in mirror dimensions: +/- 1/32".
b. Variation in square (diagonal measurements): +/- 1/16".
2. Installation tolerances:
a. Variation in plumb or square: +/- 1/8" in 10'-0".
b. Variation in face plane of adjacent mirrors: +/- 1/32".

3.07 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.08 PROTECTION OF FINISHED WORK

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace broken, cracked, chipped or otherwise damaged glazing materials and materials not meeting specified design criteria prior to Date of Substantial Completion.

C. Final cleaning: Just prior to Date of Substantial Completion, clean glass inside and out. Clean using pretested detergent and water. Flush with clean water. Repair or replace work which cannot be cleaned or which has been damaged during construction operations.

END OF SECTION

SECTION 08 9100
LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Louvers, frames, and accessories.
   1. Fixed Horizontal drainable-blade louver.

B. Louver Screens.

1.02 RELATED REQUIREMENTS

A. Section 07 2100.

B. Section 07 2400

C. Section 07 2610.

D. Section 07 6200.

E. Section 07 9005: Sealing joints between frames and adjacent construction.

F. Section 09 9000 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2015.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

F. ASTM A788 - Standard Specification for Steel Forgings, General Requirements.

G. ASTM B26 - Standard Specification for Aluminum Alloy Sand Castings.

H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.

J. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

K. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

L. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

M. ASTM D1187 - Standard Specification for Asphalt Base Emulsions for Use as Protective Coatings for Metal.

N. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

O. ASTM D2244 - Standard Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates.

P. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009.

Q. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

R. ASTM E413 - Classification for Rating Sound Insulation.

1.04 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Standard Free Area: Free area of a louver 48 inches (1220 mm) wide by 48 inches (1220 mm) high, identical to that provided.

C. Maximum Standard Airflow: Airflow at point of beginning water penetration through a louver 48 inches (1220 mm) wide by 48 inches (1220 mm) high, identical to that provided.

1.05 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.
   1. Wind Loads: Determine loads based on a uniform pressure of 20 lbf/sq. ft, acting inward or outward.

B. Seismic Performance: Provide louvers capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

C. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.06 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Cleaning methods.

C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames. Show unit dimensions related to wall openings and adjacent construction; free area for each size indicated for louvers; profiles of frames at jambs, heads, and sills; and anchorage details and locations.
   1. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
   2. For installed products indicated to comply with design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Samples for initial selection in the form of manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.

E. Samples for verification of each type of metal finish required, prepared on samples of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

F. Test Reports: Independent agency reports showing compliance with specified performance criteria.

G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Source Limitations: Obtain products through one source from a single manufacturer where alike in one or more respects regarding type, design, or factory-applied color finish.

D. AMCA Standard 500-L: Air performance, water penetration and air leakage ratings shall be determined in accordance with Air Movement and Control Association International Inc (AMCA) Standard 500, "Laboratory Methods of Testing Louvers for Rating."

E. AMCA Standard 511: Air performance, water penetration and air leakage ratings shall be licensed in accordance with Air Movement and Control Association International Inc. (AMCA) Standard 511, "Certified Ratings Program for Air Control Devices," latest edition.

F. SMACNA Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.

B. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.

C. Handling: Protect materials and finishes during handling and installation to prevent damage.

1.09 SEQUENCING AND SCHEDULING

A. Field Measurements: Verify openings and adjacent construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.
   2. Coordinate Setting Drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

1.10 PROJECT CONDITIONS

A. Coordinate work of this section with installation of mechanical ductwork and electrical services to motorized devices.

B. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.
   1. Where field measurements cannot be made without delaying the Work, guarantee opening dimensions and proceed with fabricating louvers without field measurements.

Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions.

1.11 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.
   1. Finish: Include twenty year coverage against degradation of exterior finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Louvers:
   1. Airline Louvers: www.airlinelouvers.com/#sle.
   2. Airolite Company, LLC: www.airolite.com.
   3. American Warming and Ventilating: www.awv.com.
   4. Construction Specialties, Inc: www.c-sgroup.com.

B. Substitutions: See Division 01 - Product Requirements.

2.02 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
   1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf without damage or permanent deformation.
      a. The supporting structure shall be designed to accommodate the point loads transferred by the louvers when subject to the design wind loads.
   2. Structural Performance: Provide products capable of withstanding the effects of loads and stresses from wind and normal thermal movement without evidencing permanent deformation of components including blades, frames, and supports; noise or metal fatigue caused by component rattle or flutter; or permanent damage to fasteners and anchors.
      a. Thermal Movements: Provide products that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, and other detrimental effects:
      b. Temperature Change (Range): 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.
   3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
   4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.03 MATERIALS

A. Aluminum Extrusions: ASTM B 221, alloy 6063-T5 or T-52.

B. Aluminum Sheet: ASTM B 209, alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Of same basic metal and alloy as fastened metal or 300 series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.
   1. Use types and sizes to suit unit installation conditions.

D. Anchors and Inserts: Of type, size, and material required for loading and installation indicated. Use nonferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as needed for corrosion resistance. Use toothed steel or expansion bolt devices for drilled-in-place anchors.

E. Polyvinylidene Fluoride Coating: Minimum 70 percent Kynar 500/Hylar 500 resin, two coat finish, complying with AAMA 2604.

2.04 ACCESSORIES

A. Blank-Off Panels: Aluminum face and back sheets, polyisocyanurate foam core, 1-1/2 inch thick , to match louver on exterior side.
   1. Attachment: Blank-off panels are not sealed, but fastened to the interior face of the louver.
   2. Attachment: Blank-off panels are silicone wet sealed and fastened to the interior face of the louver.

B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.

C. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel. Do not use metals that are incompatible with joined materials.
   1. Use types and sizes to suit unit installation conditions.
   2. Use Phillips flat-head screws for exposed fasteners, unless otherwise indicated.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Fasteners and Anchors: Galvanized steel.

F. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.

G. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

2.05 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

D. Include supports, anchorages, and accessories required for complete assembly.

E. Where indicated, provide subsills made of same material as louvers or extended sills for recessed louvers.

F. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, unless size of louver assembly makes bolted connections between frame members necessary.

2.06 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal Storm-Resistant Louver:
   1. Horizontal, drainable, storm proof, sight-proof, fixed-blade louvers. Extruded-aluminum frames and sight-proof louver blades, designed to collect and drain water to exterior at sill by means of gutters in front edges of blades and channels in jambs and mullions, complying with the following requirements. Coordinate size of louvers with the screen mesh to ensure that the free area of the louver will provide the required volume of air with the screen in place.
      a. Louver Depth: 6 inches, unless otherwise indicated.
      b. Frame Thickness: 0.125 inch, unless otherwise indicated.
      c. Blade Thickness: 0.081 inch, unless otherwise indicated.
      d. Blade Angle: 35 degrees, unless otherwise indicated.

B. Performance Requirements:
   1. Free Area: Not less than 5.0-aq. ft. 8.0 sq. ft for 48-inch- wide by 48-inch- high louver.

2. Air Performance: Not more than 0.10-inch wg static pressure drop at 600-fpm free-area velocity.
3. Wind-Driven Rain Performance: Not less than 99 percent effectiveness when subjected to a rain fall rate of at a core area intake velocity of 300 fpm.

2.07 LOUVER SCREENS

A. General: Provide screen at each exterior louver, mounted on interior face.

B. Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
1. Metal: Aluminum. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Mill finish.
3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.
4. Insect Screening: Aluminum, 18-by-l6mesh, 0.012-inch wire.

2.08 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish louvers after assembly.

2.09 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

B. High-Performance Organic-Coating Finish: AA-C12C42Rlx (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Fluoropolymer Two-Coat Coating System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA2605.
a. Color and Gloss: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturer's full range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

B. Verify that field measurements are as indicated.

C. Do not proceed with installation until substrates and nailers have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

3.02 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

B. If preparation is the responsibility of another installer, notify Gardner Spencer Smith Tench and Jarbeau, PC in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.03 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Set sill members and sill flashing in continuous bead of sealant.

D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

E. Secure louver frames in openings with concealed fasteners.

F. Install perimeter sealant and backing rod in accordance with Section 07 9005.

G. Coordinate with installation of mechanical ductwork.

H. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

I. 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.

3.04 ADJUSTING

A. Protect products from damage until completion of project. Use temporary protective coverings where needed and approved by manufacturer. Remove protective covering at the time of Substantial Completion.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.05 CLEANING

A. Periodically clean exposed surfaces of louvers and vents that are not protected by temporary covering to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

B. Strip protective finish coverings.

C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Rinse surfaces thoroughly and dry.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Fire rated area separation walls.

C. Gypsum wallboard.

D. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 2100: Acoustic insulation.

B. Section 072610 - Weather Resistant Membranes: Water-resistive barrier over sheathing.

C. Section 07 8400: Top-of-wall assemblies at fire rated walls.

D. Section 07 9005 - Joint Sealers: Acoustic sealant.

E. Section 09 3000 - Tiling: Tile backing board.

F. Section 09 5100 - Acoustical Ceilings: Suspension system for Gypsum Board.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute 2012.

B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2015.

D. ASTM C 36/C 36M - Standard Specification for Gypsum Wallboard; 2001.

E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2015.

F. ASTM C 630/C 630M - Standard Specification for Water-Resistant Gypsum Backing Board; 2000.

G. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2014.

H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2017.

I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2016.

J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2015.

K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2016.

L. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base 2014a.

M. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2014a.

N. ASTM E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2010.

O. GA-216 - Application and Finishing of Gypsum Board 2016.

P. GA-600 - Fire Resistance Design Manual 2015.

Q. Gypsum Construction Handbook, current edition.

R. UL (FRD) - Fire Resistance Directory current edition.

1.04 SYSTEM DESCRIPTION

A. Acoustic Attenuation for Interior Partitions Indicated as Acoustic: STC of 45-49 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.
   1. Construction designated partitions in accordance with manufacturer's written instructions, as submitted, for obtaining Sound Transmission Class (STC) rating as indicated on the drawings and in accordance with ASTM E90-81.

B. Fire Resistance for Interior Partitions Indicated as Fire Rated: Configure and install components as required by manufacturer's written instructions for types as required by designs.
   1. Designs with tests by other testing agency listed may be submitted for Gardner Spencer Smith Tench and Jarbeau, PC's acceptance, subject to prior acceptance by governing authorities and specified requirements.

1.05 DEFINITIONS

A. Gypsum Board Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.06 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   1. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
   2. Include specific requirements for fire-rated and acoustical-rated partitions.
   3. Mark manufacturer's literature to include only those products proposed for use.
   4. Include manufacturer's written confirmation of stud gauge and size necessary to meet requirements herein identified.
   5. Include details of acoustical sealant installation.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.07 QUALITY ASSURANCE

A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

B. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

C. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by independent testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Fire-Resistance-Rated Assemblies: Indicated by design designations from FM's "Approval Guide, Building Products", UL's "Fire Resistance Directory", GA-600, "Fire Resistance Design Manual", or ITS's "Directory of Listed Products."

D. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E

90 and classified according to ASTM E 413 by a qualified independent testing agency.

1. STC-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design Manual."

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Storage:
   1. Stack wallboard off floor on pallets or similar platforms providing continuous support for wallboard and prevent sagging. Stack wallboard so that long lengths are not over short lengths.
   2. Store joint compound in dry area; provide protection against freezing at all times.
   3. Do not overload floor systems.

1.09 JOB CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
   1. Install wallboard only after building is enclosed. Maintain uniform temperature in 55 degree F. to 80 degree F. range for 48 hours before, during, and after installation and finishing.

B. Ventilation:
   1. Provide ventilation during and following joint treatment and adhesive applications.
   2. Use temporary air circulators in enclosed areas lacking natural ventilation.
   3. Under slow drying conditions, allow additional drying time between coats of joint treatment.
   4. Protect installed materials from drafts during hot, dry weather.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 GENERAL

A. All products shall be totally Asbestos-Free.

2.03 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
   2. Consolidated Systems, Inc: www.csisteel.com.
   3. Dale/Incor: www.daleincor.com.
   4. Dietrich Metal Framing: www.dietrichindustries.com.
   5. National Gypsum Company: www.nationalgypsum.com.
   6. Suspension Corporation: www.scafco.com.
   7. Unimast, Inc: www.unimast.com.
   8. Substitutions: See Division 01 - Product Requirements.

B. Metal Framing Connectors and Accessories:
   1. Same manufacturer as framing.

2.04 STEEL SUSPENDED CEILING AND SOFFIT FRAMING

A. Components, General: Comply with ASTM C 754 for conditions indicated.

B. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf. Except as indicated on the drawings stud gauge shall be minimum 20 ga.

1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
2. Studs: "C" shaped with flat or formed webs with knurled faces.
   a. ASTM C 645.
   b. Minimum Base Metal Thickness: 0.0179-inch (0.45-mm).
   c. Depth: As indicated.
3. Runners: U shaped, sized to match studs.
4. Cold-Rolled Channel Bridging:
   a. 0.0538-inch (1.37-mm) bare steel thickness, with minimum 1/2-inch (12.7-mm) wide flange.
   b. Depth: 1-1/2 inches (38.1 mm).
   c. Clip Angle: 1-1/2 by 1-1/2 inch (38.1 by 38.1 mm), 0.068-inch (1.73-mm) thick, galvanized steel.
5. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22.2-mm).
6. Resilient Furring Channels: Asymmetrical or hat shaped.
   a. 1/2-inch (12.7-mm) deep, steel sheet members designed to reduce sound transmission.
   b. Configuration: Asymmetrical or hat shaped, with face attached to single flange by slotted leg (web) or attached to two flanges by slotted or expanded metal legs.
7. Deep-Leg Deflection Track: ASTM C 645 top runner with 2-inch (50.8-mm) deep flanges.
8. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
   a. Minimum Base Metal Thickness: 0.0598-inch (1.5-mm).

C. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
   3. Provide Z-clip components UL-listed for use in UL-listed fire-rated head of partition joint systems and fire proofing of fire rating and movement required.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      b. Provide top runner manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
         1) Product: Subject to compliance with requirements, provide one of the following:
            (a) Fire Trak Corp.; Product: Fire Trak.
            (b) Metal-Lite, Inc.; Product: The System.
            (c) Clarkwestern Dietrich Building Systems LLC; MaxTrak.

2.05 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com.

2. Georgia-Pacific Gypsum: www.gpgypsum.com.
3. National Gypsum Company: www.nationalgypsum.com.
4. USG Corporation: www.usg.com.
5. Substitutions: See Division 01 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

C. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
   1. Regular Type:
      a. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
      b. Thickness: 1/2 inch, or as indicated.
      c. Edges: Tapered.
   2. Fire Resistant Type: Complying with Type X requirements; UL or WH rated.
      a. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
      b. Application: Where required for fire-rated assemblies, unless otherwise indicated.
      c. Thickness: 1/2 inch, or as indicated.
      d. Edges: Tapered.
   3. Flexible Board: Special flexible board to bend fit tight radii.
      a. Application: Where required for tight radii to be more flexible than standard regular type panels of the same thickness, unless otherwise indicated. Apply in double layer at curved assemblies.
      b. Thickness: 1/4 inch, or as indicated.
      c. Edges: Tapered.

D. Water-Resistant Type: Sizes to minimize joints in place.
   1. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
      a. Application: Vertical surfaces behind thinset tile, except in wet areas.
      b. Core Type: Regular and Type X, as indicated.
      c. Thickness: 1/2 inch and 5/8 inch, as indicated.
      d. Edges: Tapered.

2.06 ACCESSORIES

A. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness 2" or as indicated on the drawings.
   1. Contractor's option: Based on sound ratings and fire-resistance ratings required for assemblies, Contractor may select glass fiber or mineral wool sound attenuation materials as follows:
      a. Glass fiber attenuation batts:
         1) Acceptable products:
            (a) CertainTeed Corp., Sound Control Batts.
            (b) Fibrex, Sound Attenuation Batts.
            (c) Owens-Corning Corp., Sound Attenuation Batts.
         2) Characteristics:
            (a) Type: Unfaced fiberglass batts for friction fit between studs.
            (b) Surface burning characteristics: Maximum 25 flame spread and 50 smoke development when tested in accord with ASTM E84-97a.
            (c) Assembly STC: As indicated in the drawings.
            (d) Thickness: As indicated in the drawings.
      b. Mineral wool sound attenuation blankets:
         1) Acceptable products:

(a) Fibrex, Inc., FBX Sound Control Fire Blankets.
(b) Partek Insulations, Inc., Paroc Sound Attenuation Batts.
(c) USG Interiors, Inc., Thermafiber Sound Attenuation Fire Blankets (SAFB).

2) Characteristics:
(a) Type: Minimum 2.5 pcf density, paperless, semi-rigid mineral wool fiber blanket complying with ASTM C665-95, Type 1.
(b) Surface burning characteristics: Maximum 15 flame spread and smoke development when tested in accord with ASTM E84-97a.
(c) Assembly STC: As indicated in the drawings.
(d) Assembly fire-resistance rating: Meeting UL assemble noted in the drawings.

B. Acoustical tape: Closed cell polyvinyl chloride foam tape, 1/4" thickness by 1" wide.

C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
1. Types: As detailed or required for finished appearance.
2. Shapes:
a. Cornerbead: Use at outside corners.
b. LC-Bead: J-shaped; exposed long flange receives joint compound; use at exposed panel edges.
c. L-Bead; L-shaped; exposed long flange receives joint compound; use where indicated.
d. U-Bead; J-shaped; exposed short flange does not receive joint compound; use where indicated.
e. Expansion (control) Joint: Use where indicated.
f. Curved-Edge Cornerbead: With notched or flexible flanges; use at curved openings and where indicated.

D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
1. Interior Gypsum Board Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
a. Tile Backing Panels: As recommended by panel manufacturer.
2. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or successive coats.
a. Prefilling: At open joints, rounded or beveled panel edges, and damage surface areas, use setting-type taping compound.
b. Embedding and First Coat: For embedding tape and first coat joints, fasteners, and trim flanges, use setting-type taping compound or drying-type, all purpose compound.
1) Use setting-type compound for installing paper-faced metal trim accessories.
c. Fill Coat: For second coat, use drying-type, all purpose compound.
d. Finish Coat: For third coat, use drying-type, all-purpose compound.
e. Skim Coat: For final coat of Level 5 finish, use drying-type, all purpose compound.
3. Joint Compound for Tile Backing Panels:
a. Water-Resistant Gypsum Backing Board: Use setting-type taping and setting-type, sandable topping compounds.
b. Cementitious Backer Units: As recommended by manufacturer.

E. Corner reinforcement: Galvanized steel with 1-1/4" wide fine expanded mesh flanges.

F. Metal jamb, ceiling and casing trim: Manufacturer's standard "L" and "U" shaped galvanized members with fine expanded mesh flanges; "mud-in" type for finishing with joint compound.

G. Control joints: Roll-formed galvanized steel.

H. Furring channels: Minimum 25 ga. galvanized steel, 7/8" deep by 1-3/8" face width.

I. "Z" furring channels: Minimum 25 ga. galvanized steel, 1" deep.

J. Cold-rolled channels: Minimum 16 ga. steel, galvanized or black asphaltum-painted, 1-1/2" deep.

K. Furring channel clips: Manufacturer's standard type for attachment of furring channels to cold-rolled runner channels.

L. Resilient channel: Galvanized steel, manufacturer's standard type.

M. Furring brackets: Minimum 20 ga. galvanized steel, for attaching 3/4" furring channels to masonry walls.

N. Special trim shapes:
   1. Acceptable manufacturers; subject to compliance with specified requirements:
      a. Basis of design: Fry Reglet Corp., shapes including, but not limited to, "F" Reveal Molding and Radiused Corner Trim.
      b. MM Systems Corp
      c. Gordon, Inc.
      d. Pittcon Industries, Inc.
   2. Characteristics:
      a. Material: Manufacturer's standard aluminum alloy.
      b. Finish: Painted finish, Color selected by Gardner Spencer Smith Tench and Jarbeau, PC.
      c. Shapes: As indicated on the drawings.

O. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

P. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

Q. Screws: ASTM C 1002; self-piercing tapping type, unless otherwise indicated.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
   2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

R. Isolation Strip at Exterior Walls:
   1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (no.15 asphalt felt), nonperforated.

S. Vapor Retarders:
   1. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.
   2. Fire-Retardant, Reinforced-Polyethylene Vapor Retarders: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either a nonwoven grid of nylon cord or polyester scrim and weighing not less than 22 lb/1000 sq. ft., with maximum permeance rating of 0.1317 perm, and flame-spread and smoke-developed indices of not more than 5 and 60, respectively.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Global Plastic Sheeting; Poly Scrim 6FR.
         2) Raven Industries, Inc.; DURA-SKRIM 2FR.
         3) Reef Industries, Inc.; Griffolyn T-55 FR.
   3. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

B. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Suspended Ceilings: Coordinate installation of ceiling suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers at spacing required to support ceilings and that hangers will develop their full strength.
   1. Furnish devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.03 FRAMING INSTALLATION, GENERAL

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Runners:
   1. Attach at floor and underside of structural deck with specified fasteners.
   2. Where partitions are indicated to stop at finish ceiling, attach to ceiling suspension system using 1/8" toggle bolts or sheet metal screws spaced at 1'-4" o.c., maximum, where partition aligns with ceiling grid. Where partition does not align with grid, attach at each intersection with grid.
   3. Install runners indicated to receive sound attenuation blankets in two beads of acoustical sealant, continuous.

C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions and as noted herein.
   3. Provide double studs at interior and exterior corners, expansion joints, partition termination and adjacent to door and borrowed lite openings in partitions. Locate next stud not more than 6" from double studs.
   4. Secure abutting and intersecting walls with fasteners through stud flanges.
   5. For horizontal reinforcement at door and borrowed lite frames, install cut-to-length runner sections with slit flanges secured to studs.
   6. Install acoustical tape on metal studs which abut other studs or dissimilar surfaces in walls to receive around attenuation blankets.

D. Furring:
   1. Attach to masonry substrate with fasteners spaced at 2'-0" o.c. on alternating furring channel flange.
   2. Position channels vertically, spaced at 2'-0" o.c., maximum.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

E. Steel Plate Supports: Install minimum 20 gauge, 6 inch width sheet metal plates attached to metal studs of wallboard partition at stair handrail locations. Position plates at handrail height and rise for handrail bracket attachment. Attach to metal framing and sheet metal screws; provide plates in lengths to span across minimum two studs at bracket attachment points.

F. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

G. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

H. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."

I. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement.
   1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
   2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
      a. Use deep-leg deflection track where indicated.
      b. Use firestop track in fire rated partitions.
   3. Do not bridge building control and expansion joints with steel framing or furring members. Frame both sides of joints independently.

3.04 STEEL SUSPENDED CEILING AND SOFFIT FRAMING

A. Suspend ceiling hangers from building structure as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
   3. Secure wire hangers by looping and wire-tying, either directly to structure or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in manner that will not cause them to deteriorate or otherwise fail.
   4. Secure rod, flat, or angle hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
   5. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
   6. Do not attach hangers to steel deck tabs.
   7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

B. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member and transversely between parallel members.

C. Sway-brace suspended steel framing for "clouds" with hangers used for support.

D. Wire-tie furring channels to supports.

E. Install suspended steel framing components in sizes and spacings indicated, but not less than required by the referenced steel framing and installation standards.
   1. Hangers: 48 inches (1219 mm) o.c.
   2. Channels (Main Runners): 48 inches (1219 mm) o.c.
   3. Furring Channels (furring Members): 16 inches (406 mm) o.c.

F. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.05 STEEL PARTITION AND SOFFIT FRAMING

A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.
   1. Where studs are installed directly against exterior walls, install asphalt-felt isolation strip between studs and wall.

B. Extend partitions framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
   1. Cut studs 1/2 inch (13 mm) short of full height to provide perimeter relief.
   2. For fire-resistance-rated and STC-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid-structure surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board enclosures and to make partitions continuous from floor to underside of solid structure.
   3. Stud size: As indicated on the drawings.
   4. Stud gauge: As required by manufacturer's written product data for heights and conditions of use, with a maximum allowable deflection of L/240, except framing supporting ceramic tile finish shall be minimum 20 gauge.
   5. Head: Provide Z-clip members at all partitions that extend to structural supports or the underside of floor/roof slabs and decks that are required to be provided with sprayed applied fireproofing.

C. Install steel studs and furring at the following spacings:
   1. Single-Layer Construction: 16 inches (406 mm) o.c.
   2. Multi-Layer Construction: 16 inches (406 mm) o.c.
   3. Cementitious backer Units: 16 inches (406 mm) o.c.

D. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.

E. Curved Partitions:
   1. Cut top and bottom track (runners) through leg and web at 2-inch (50-mm) intervals for arc length. In cutting lengths of track, allow for uncut straight lengths of not less than 12 inches (300 mm) at ends of arcs.
   2. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
   3. Support outside (cut) leg of track by clinching steel sheet strip, 1-inch (25-mm) high-by-thickness of track metal, to inside of cut legs using metal lock fasteners.
   4. Begin and end each arc with a stud, and space intermediate studs equally along arcs at stud spacing recommended in writing by gypsum board manufacturer for radii indicated. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches (150 mm) o.c.

F. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   1. Install two studs at each jamb.
   2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint.
   3. Extend jamb studs through suspended ceilings and attach to underside of floor/roof structure above.

G. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

H. Polyethylene Vapor Retarder: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
   1. Set vapor-retarder-faced units with vapor retarder to warm side of construction. Do not obstruct ventilation spaces, except for firestopping.
   2. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer’s instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
   3. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
   4. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.06 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Install sound attenuation blankets before 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 avoid abutting end joints in 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. 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 edge and 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. Do not make joints other than control joints at corners of framed openings.

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. Form control and expansion joints with space between edges of adjoining gypsum panels.

I. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Unless 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 joist, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joist, and other structural members; allow 1/4 to 3/8 inch (6.4 to 9.5 mm) wide joints to install sealant.

J. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. 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.

1. Seal joints between edges and abutting structural surfaces of fire-rated partitions with firestopping sealant.

K. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies including sealing partitions above acoustical ceilings.

L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

M. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.07 PANEL APPLICATION METHODS

A. Single-Layer Non-Rated:
1. Ceilings: Apply wallboard with long dimension at right angles to framing. Terminate edges of wallboard running parallel to framing on framing members.
2. Walls: On partitions/walls, apply gypsum panels in direction to minimize end joints, unless otherwise required by fire-resistance-rated assembly.
a. Apply wallboard vertically or horizontally at Contractor's option, except as required by wallboard manufacturer's product data for system designs, including fire-rated and acoustically-rated partitions.
b. Stagger joints in opposite sides of partitions.
c. At stairwells and other high walls, install panels horizontally, unless otherwise required by fire-resistance-rated assembly.
d. Terminate edges of wallboard running parallel to framing, furring on framing or furring members.
e. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
f. Fastening: Attach wallboard using fasteners specified, at spacings required by manufacturer's product data.

B. Multi-Layer Non-Rated:
1. Base layer:
a. Ceilings: Apply base layer with long dimension at right angle to framing. Terminate edges of wallboard running parallel to framing on framing members.
b. Walls: Apply base layer vertically. Terminate edges of wallboard running parallel to framing, furring on framing or furring members. Stagger vertical joints on opposite sides of partitions.
c. Fastening: Attach wallboard using fasteners specified, at spacings required by manufacturer's product data.
2. Face Layer:
a. Apply face layer at right angle to base layer with minimum 10" offset in parallel base and face layer joints.
b. Fastening: Attach wallboard using fasteners specified, at spacings required by manufacturer's product data.

C. Tile Backing Panels:
1. Water-Resistant Gypsum Backing Board: Install at plumbing fixture walls and where indicated. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
2. Backer Units: ANSI A108.11, at showers, tubs, and where indicated.
3. Areas Not Subject to Wetting: Install standard gypsum board panels to produce a flat surface except at showers, tubs, kitchens, and other wet locations indicated to receive

water-resistant panels.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
   1. For fire-rated and acoustically rated construction, comply with requirements of tested assemblies scheduled on the drawings.
   2. Continue all required components of fire-rated and acoustically rated wall assembly to overhead structure. Apply joint tape and one coat of compound to wallboard joints concealed from view in completed work.
   3. Seal openings and penetrations in fire-rated construction as specified in Firestopping section.
   4. Identify fire-rated partitions above finished ceiling line with stenciled red lettering reading, "FIRE AND SMOKE BARRIER - PROTECT ALL OPENINGS". Apply lettering in approximately 1-1/2" high letters. Space approximately 10'-0" o.c. Apply to both sides of partitions.

3.08 INSTALLATION OF TRIM AND ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise attach trim according to manufacturer's written instructions.

B. Control Joints: Place control joints consistent with lines of building spaces and as indicated. Provide supplementary framing and materials as required.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. Construct control joints in fire rated partitions in accordance with manufacturer's details.
   3. Install control joints according to ASTM C 840 and in specific locations shown by Gardner Spencer Smith Tench and Jarbeau, PC as well as approved locations by Gardner Spencer Smith Tench and Jarbeau, PC for visual effect.
   4. At exterior soffits, not more than 30 feet apart in both directions.

C. Corner Beads: Install at external corners, using longest practical lengths.

D. Radiused Corner Trim: Install at external corners where indicated on the drawings.

E. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.09 JOINT TREATMENT

A. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.
   1. Above Finished Ceilings Concealed From View: Level 1.
   2. Utility Areas and Areas Behind Cabinetry: Level 2.
   3. Walls scheduled to receive textured wall finish: Level 3.
   4. Walls and Ceilings to Receive Flat, Eggshell or Semi-Gloss Paint Finish: Level 4.
   5. Walls and Ceilings to Receive Gloss Paint Finish: Level 5.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.10 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.11 FIELD QUALITY CONTROL

A. Above Ceiling Observation: Before Contractor installs gypsum board ceilings, Gardner Spencer Smith Tench and Jarbeau, PC will conduct an above ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board ceiling support framing until deficiencies have been corrected.
   1. Notify Gardner Spencer Smith Tench and Jarbeau, PC seven days in advance of date and time when Project, or part of Project, will be ready for above ceiling observation.
   2. Before notifying Gardner Spencer Smith Tench and Jarbeau, PC, complete the following in areas to receive gypsum board ceilings.
      a. Installation of 80 percent of lighting fixtures, powered for operation.
      b. Installation, insulation, and leak and pressure testing of water piping system.
      c. Installation of air-duct system.
      d. Installation of air devices.
      e. Installation of mechanical system control-air tubing.
      f. Installation of ceiling support framing.

3.12 FINISH LEVEL SCHEDULE

A. Level 1: Above finished ceilings concealed from view.
   1. Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound assemblies.
   2. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

B. Level 2: Utility and tile areas and areas behind cabinetry.
   1. Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges for at least 12 inches in width.
   2. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

C. Level 3: Walls scheduled to receive textured wall finish.
   1. Embed tape and apply separate first, and finish coats of joint compound to tape, fasteners, and trim flanges for at least 18 inches in width.
   2. All joint compound shall be smooth and free of tool marks and ridges.

D. Level 4: Walls and ceilings scheduled to receive flat, eggshell or semi-gloss paint finish.
   1. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges for at least 24 inches in width, where light-textured finish wallcoverings and flat eggshell or semi-gloss paints are indicated.
   2. All joint compound shall be smooth and free of tool marks and ridges.

E. Level 5: Walls and ceilings scheduled to receive gloss paint finish.
   1. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges for at least 24 inches in width, and apply skim coat of joint compound over entire surface where semigloss or gloss paint and surfaces subject to severe lighting are indicated.

END OF SECTION

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for wall applications.

B. Accessories.

C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-In-Place Concrete.

B. Section 033513 - Concrete Finishing.

C. Section 042200 - Concrete Unit Masonry.

D. Section 07 9005: Sealing joints between tile work and adjacent construction and fixtures.

E. Section 092116 - Gypsum Board Assemblies: Installation of water-resistant and tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2013.1.
   1. ANSI A108.1A - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.
   2. ANSI A108.1B - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
   3. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
   4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.
   5. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.
   6. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2013.1.
   7. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2013.1.
   8. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2013.1.
   9. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.
   10. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2013.1.
   11. ANSI A108.12 - American National Standard Specifications for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 2013.1.
   12. ANSI A108.13 - American National Standard Specifications for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2013.1.
   13. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2013.1.

B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.

D. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation - Version; 2013.1.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 DEFINITIONS

A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.

B. Facial Dimension: Nominal tile size as defined in ASTM A137.1.

1.06 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
   1. Level Surfaces: Minimum 0.6.
   2. Wet and Ramp Surfaces: Minimum 0.8.

B. Load-Bearing Performance: For ceramic tile installed on walkway surfaces, provide installations rated for the following load-bearing performance level based on testing assemblies according to ASTM C 627 that are representative of those indicated for this Project:
   1. Heavy: Passes cycles 1 through 12.

1.07 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
   1. Tile layout starting points and locations.
   2. Coordination of floor pattern with base and wall patterns.

D. Samples for Verification: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
   1. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required. Use grout of type and color or colors approved for completed work.
   2. Full-size units of each type of trim and accessory for each color and finish required.
   3. Stone thresholds in 6-nch (150-mm) lengths.
   4. Metal edge strips in 6-inch (150-mm) lengths.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

G. Qualification Data: For Installer.

1.08 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

D. Source Limitations for Tile: Obtain all tile of same color or finish from one source or producer.
   1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

E. Source Limitations for Setting and Grouting Materials: Obtain ingredients of uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
   1. Setting and Grouting Material Approval: Submit letter from mortar, grout and latex additive manufacturer approving products proposed for use in accordance with setting and grouting material requirements specified herein.

F. Source Limitations for Other Products: Obtain each of the following products specified in the Section through one source from a single manufacturer for each product:
   1. Stone thresholds.
   2. Waterproofing.
   3. Metal edge strips and trim.

G. Allowable Tolerances: Finished work shall be plumb, level and true to line within ± 1/4" in an undivided space and ± 1/16" maximum in a running foot, non-cumulative.

1.09 MOCK-UP

A. See Division 01 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up where indicated on the drawings, incorporating all components specified for the location.
   1. Minimum size of mock-up is indicated on the drawings.
   2. Approved mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

C. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.11 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.12 EXTRA MATERIALS

A. Provide 10 sq. ft of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Basis of Design: See Drawings.
   2. Substitutions: See Division 01 - Product Requirements.

2.02 TILE PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements.
   2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
   1. Match Gardner Spencer Smith Tench and Jarbeau, PC's samples or as indicated in the Finish Schedule.

D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile taken from one package show range in colors as those taken from other packages and match approved Samples.

E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

F. Mounting: For factory-mounted tile, provide back or edge mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
   1. Where tile is indicated for installation in wet areas, do not use back or edge mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.03 TILE PPODUCTS

A. Glazed Wall Tile Type GWT: ANSI A137.1 , and as follows: Flat tile as follows:
   1. Basis of Design: See Drawings.

2.04 TRIM AND ACCESSORIES

A. Trim: Matching bullnose, surface bullnose, double bullnose, and cove base ceramic shapes in sizes coordinated with field tile.
   1. Manufacturer: Same as for tile.

B. Non-Ceramic Trim: Integrally colored extruded PVC, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications: Use in the following locations:
      a. Expansion and control joints, floor and wall.
   2. Expansion Joint Manufacturer:
      a. Basis of Design: Schluter-Systems; Product DILEX-BT/-BT/O/-BTS: www.schluter.com.
      b. Other acceptable manufacturers: Profilpas and Construction Specialties, Inc.
      c. Substitutions: See Division 01 - Product Requirements.
   3. Control Joint Manufacturer:
      a. Schluter-Systems; Product DILEX-AKWS: www.schluter.com.
      b. Other acceptable manufacturers: Genesis APS International and Ceramic Tool Company, Inc.
      c. Substitutions: See Division 01 - Product Requirements.

2.05 SETTING MATERIALS

A. Provide setting materials made by the same manufacturer as grout.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Application(s): Use this type of bond coat where indicated and where no other type of bond coat is indicated.

2.06 MORTAR MATERIALS

A. Manufacturers:
   1. Bonsal American, Inc: www.sakrete.com
   2. Bostik, Inc: www.bostik-us.com.
   3. Custom Building Products: www.custombuildingproducts.com.
   4. Laticrete International, Inc: www.laticrete.com.
   5. MAPEI Corporation: www.mapei.com.
   6. Summitville Tiles, Inc: www.summitville.com.
   7. TEC Specialty Products, Inc: www.tecspecialty.com.
   8. Substitutions: See Division 01 - Product Requirements.

B. Mortar Bed Materials: Portland cement, sand, latex additive and water.

C. Mortar Bond Coat Materials for Thin-Set Installations:
   1. Latex-Portland Cement type: ANSI A118.4.

2.07 GROUTS

A. Manufacturers:
   1. Bonsal American, Inc: www.sakrete.com
   2. Bostik Inc: www.bostik-us.com.
   3. Custom Building Products: www.custombuildingproducts.com.
   4. Laticrete International, Inc: www.laticrete.com.
   5. MAPEI Corporation: www.mapei.com.
   6. Summitville Tiles, Inc: www.summitville.com.
   7. TEC Specialty Products, Inc: www.tecspecialty.com.
   8. Substitutions: See Division 01 - Product Requirements.

B. Grout: Polymer modified cement grout, sanded or unsanded, as specified in ANSI A118.7.
   1. Commercial Portland Cement Grout, latex-modified:
      a. Material: Factory-prepared, sanded, mixture of portland cement, graded aggregates, color-fast mineral oxide pigments and additives meeting ANSI A118.7; mixed with latex additives as specified herein.
   2. Dry-set Grout, latex modified:
      a. Material: Factory-prepared, unsanded, mixture of portland cement, color-fast pigments and water retentive additives meeting ANSI A118; mixed with latex additives as specified herein.
   3. Grout Color: See Drawings and Finish Schedule.

2.08 LATEX ADDITIVES

A. Type: Grout and mortar manufacturer's liquid type latex additive formulated for field mixing. Additives shall be types as recommended and approved in writing by grout and mortar manufacturer.

B. Proportion and Mixing: Latex additives shall be used for mixing with all mortars and grouts as specified. Comply with manufacturer's product data for latex additive proportions and mixing instructions.

2.09 ACCESSORY MATERIALS

A. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.10 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
   2. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
   3. Verify that installation of anchors, recessed frames, electrical and mechanical units work, and similar items located in or behind tile has been completed before installing tile.
   4. Verify that joints and cracks in tile substrates are coordinated with the joint locations; if not coordinated, adjust joint locations in consultation with Gardner Spencer Smith Tench and Jarbeau, PC

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
   1. Moisture Emission Rate: Not greater than 3 lb per 1000 sq ft per 24 hours, test in accordance with ASTM F1869.
   2. Alkalinity (pH): Verify pH range of 5 to 9, test in accordance with ASTM F710.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

D. Provide concrete substrates for tile floors installed with adhesive or thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
   1. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances. Use product specifically recommended by tile-setting material manufacturer.

E. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

F. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous

film of temporary protective coating, taking care not to coat unexposed tile surfaces.

G. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1A thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignment.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

F. Form internal angles square and external angles bullnosed.

G. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
   1. Tiles cut more than half it's width will not be accepted.
   2. Apply sealant to fill gap between cut tiles and built-in items.

H. Install non-ceramic trim in accordance with manufacturer's instructions.

I. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
   1. Fore tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

J. Lay out tile wainscots to next full tile beyond dimensions indicated.

K. Sound tile after setting. Replace hollow sounding units.

L. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

M. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

N. Grout tile joints. Use standard grout unless otherwise indicated.

O. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

P. Control and expansion joints:
   1. Confirm that control, contraction, isolation and expansion joints are located in accord with approved shop drawings, TCA handbook EJ171 details, and approved in advance by Gardner Spencer Smith Tench and Jarbeau, PC. Do not saw-cut joints after installing tiles.
   2. Provide control joints and expansion joints through tile and setting bed.
      a. Field of floor control joints shall be located as follows:
         1) Spacing indicated, but not less than 16'-0" o.c. each direction.
         2) Over cold joints and saw-cut control joints.
         3) Where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings, and where changes occur in backing material.
      b. Install building expansion joints as indicated on drawings.

c. Locations of all joints shall be approved in advance by Gardner Spencer Smith Tench and Jarbeau, PC. Width of joints shall match width of grout joints, except control joint shall not be less than 1/4" wide.
d. Prime joints in accord with sealant manufacturer's product data. Following tile work completion, seal joints in accord with TCA handbook, using specified sealant.

3.04 INSTALLATION - WALL TILE

A. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.
1. Where mortar bed is indicated, install in accordance with TCNA (HB) Method W222, one coat method.

3.05 CLEANING

A. On completion of placement and grouting, clean tile and grout surfaces so they are free of foreign matter.
1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacture that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacture, apply coat of neutral protective cleaner to completed tile and floors.

C. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.06 PROTECTION

A. Do not permit traffic over finished floor surface for 7 days after installation.

B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

3.07 SCHEDULE

A. Walls:
1. Wall Tile: Interior Wall Installations on masonry and tile backer board, thinset, tile and base.
a. Installation Method: TCA W202 and W244 and ANSI A 108 respectfully.
b. Setting Method: Latex-modified dry-set mortar.
c. Grout Type: Latex-modified commercial portland grout.
d. Tile and Base Type:
1) See Drawings and Finish Schedule.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

C. Supplementary acoustical insulation above ceiling.

1.02 RELATED REQUIREMENTS

A. Section 07 9005: Acoustical sealant.

B. Section 092116 - Gypsum Board Assemblies: Acoustical insulation.

C. Division 23: Mechanical.

D. Division 26: Electrical.

1.03 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2013.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2020.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2019.

E. UL (FRD) - Fire Resistance Directory current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and based on field-verified dimensions.
   1. Indicate complete plan layouts and installation details.
   2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.
   3. Include all edge tile dimensions, show locations of all in-ceiling items required for the project, and dimension all in-tile items which will not be centered in the tile units.
   4. The Contractor is alerted to the possibility that the Contract Drawing Reflected Ceiling Plans may not necessarily show every in-ceiling item required for the project.
   5. The Contractor will be allowed to utilize the Contract Drawing Reflected Ceiling Plans as basis for formulation of the required complete shop drawings for Gardner Spencer Smith Tench and Jarbeau, PC's approval.

C. Product Data: Provide data on suspension system components and acoustical units.
   1. Suspension System for Lay in Ceiling: Printed data for all suspension system components, including load tests and manufacturer's recommended methods for fixture support and wind uplift bracing.

D. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 12 inches long, of suspension system main runner.

F. Manufacturer's Installation Instructions: Indicate special procedures.

1.06 QUALITY ASSURANCE

A. Source Limitations:
   1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
   2. Suspension System: Obtain each type through one source from a single manufacturer.

B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
   1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.

C. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

E. Each type of acoustical panel and painted grid shall be from a single production run.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Storage:
   1. Stack ceiling tiles off floor on pallets or similar platforms providing continuous support for ceiling tiles and prevent sagging.
   2. Do not overload floor systems.

1.08 MOCK-UP

A. Install a minimum 12' x 12' area of each ceiling type specified, in spaces designated by Gardner Spencer Smith Tench and Jarbeau, PC. Include a 12' length of panels field-cut along wall line to illustrate proposed edge tile technique and workmanship. Include a mock-up of each type of tile, cut-in for installation of each type of light fixture, exit light, sprinkler head, speaker, monitor, diffuser, and all other in-ceiling-tile items.

B. Notify Gardner Spencer Smith Tench and Jarbeau, PC when spaces are ready for observation.

C. Following Gardner Spencer Smith Tench and Jarbeau, PC's acceptance, retain mock-up as a standard of quality for ceiling installations. Accepted mock-ups may remain as part of finished work.

1.09 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.10 PROJECT CONDITIONS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustical units after interior wet work is dry.

C. Schedule acoustical material installation to minimize need for removal and replacement of acoustical units to accommodate work of other trades.

1. Before concealing Work of other sections, verify required tests and inspections have been completed.

D. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and all penetrations with related Work section.

1.11 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.12 EXTRA MATERIALS

A. See Division 01 - Product Requirements, for additional provisions.

B. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than 8 of each specified size, style and color.

1.13 WARRANTY

A. See Closeout Submittals, for additional warranty requirements.

B. Manufacturer shall provide a 10 year material warranty from Date of Substantial Completion.

C. Installer shall provide a 2 year labor warranty from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:
1. Basis of design: Armstrong World Industries, Inc: www.armstrong.com.
2. CertainTeed Ceilings: www.certainteed.com.
3. USG: www.usg.com.
4. Substitutions: See Division 01 - Product Requirements.

B. Acoustical Units - General: ASTM E1264, Class A.

C. Acoustical Panels Type ACT-1: Typical acoustical panel unless noted otherwise on the Drawings.
1. Acceptable products, subject to compliance with all criteria:
   a. Match Existing.
2. Characteristics:
   a. Size: 24 x 48 inches.
   b. Thickness: TBD inches.
   c. Edge: Match Existing.
   d. Surface Burning Characteristics: Class A, minimum 25 flame spread rating when tested in accordance with ASTM E84-89a.
   e. Suspension System: Type Match Existing.

2.02 SUSPENSION SYSTEMS

A. Manufacturers:
1. Armstrong World Industries, Inc: www.armstrong.com.
2. Chicago Metallic Corporation: www.chicagometallic.com.
3. USG: www.usg.com.
4. Substitutions: See Division 01 - Product Requirements.

B. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

C. Standard Exposed Grid System: Typical unless otherwise indicated on the Drawings.
1. Structural classification: ASTM C635-86, Intermediate duty for all components.

2. Modules:
   a. Style: Match Existing.
   b. Other: As indicated on the Drawings.
3. Finish on exposed components: Chemically treated for paint adhesion with factory applied, low-gloss white paint finish.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.

C. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

D. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in-place.

E. Acoustical Insulation: Specified in Section 09 2116 - Gypsum Board Assemblies.
   1. Thickness: 2 inch minimum or as indicated in the drawings.

F. Acoustical Sealant For Perimeter Moldings: Specified in Section 07 9005 - Joint Sealers.

G. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. With Installer present, examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Verify existing conditions before starting work.

C. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

A. Furnish layouts for inserts, clips or other supports and struts required to be installed by the Work of other trades that depend on the suspended ceiling system for support.

B. Coordinate related Work to ensure completion prior to installation of clips or fasteners.

C. Lay-In Ceiling Systems: Compare layouts with construction conditions. Tile shall be spaced symmetrically about the centerlines of the room or space, and shall start with a tile or joint line as required to avoid narrow tiles at the finish edges unless indicated otherwise. Joints shall be tight with joint lines straight and aligned with the walls. Ceiling moldings shall be provided where tile abuts wall with matching caulking to eliminate any space.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. System shall be complete; with all joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.

D. Hanger Wires: 12 gauge minimum; larger sizes as indicated or required.
   1. Fasten wires to panel points and structure above per most stringent requirements of fabricator and IBC and as indicated on Drawings.
   2. Wires exceeding 1:6 out-of-plumb shall be braced with counter-sloping wires.

3. Maintain wires 6 inches minimum clear of non -braced ducts, pipes, and other items.
4. Install wire within 6 inches of ends of all main runners and cross-tees at ceiling perimeters.
5. Where obstructions prevent direct suspension, provide trapezes or equivalent devices; 1-1/2 inches minimum cold-rolled channels back to back may be installed for spans to 6 feet max.
6. Wire to be straight, without extraneous kinks or bends and tolerate a 200 - pound pull without stretching or shifting the suspension clip.

E. Bracing Wires to Resist Seismic Forces: 12 gauge minimum, larger sizes as indicated or required.
   1. System for Bracing Ceilings: Lay-In Ceiling Systems: Install one four-wire set of sway-bracing wires and a vertical strut for each 144 square feet maximum of ceiling area. Locate wire-sets and struts at 12 feet maximum on center. At ceiling perimeters, wire-sets shall be installed within 6 feet of walls.
   2. Install four-wire sets and struts within 2 inches of cross-runner intersection with main runner; space wires 90 degrees from each other.
   3. Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.
   4. Wires shall be tight, without causing ceiling to lift.
   5. Fasten struts in accordance with IBC requirements.

F. Suspension:
   1. Suspension members shall be fastened to 2 adjacent walls; but shall be 1/2 inches minimum clear of other walls.
   2. Any suspension members not fastened to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or 7445 stabilizer bar or 16 gauge taut tie wire.
   3. Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross-bracing necessary to securely support any surface mounted fixtures or other items.

G. Attachment of Wires:
   1. To Metal Deck or Steel Framing Members: Install as required by current code.
   2. To Suspension Members: Insert through holes in members or supporting clips.
   3. All wires to be fastened with tight turns; three tight turns minimum for hanger wires; four tight turns minimum for bracing wires. All turns to be made in a 1-1/2 inches maximum distance.

H. Locate system on room axis according to reflected plan.

I. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

J. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

K. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

L. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

M. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

N. Do not eccentrically load system or induce rotation of runners.

O. Touch up damaged or cut galvanized components as recommended by the manufacturer to prevent rusting.

P. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install in bed of acoustical sealant.
   2. Use longest practical lengths.
   3. Overlap and rivet corners.

Q. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 AIR DISTRIBUTION DEVICES

A. Refer to and coordinate with Division 23: Mechanical.

B. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 12 gauge minimum, to each device within 3 inches of device corners, to support their weight independent of the suspension system.

3.06 LIGHT FIXTURES

A. Refer to and coordinate with Division 26: Electrical.

B. Fixtures weighing less than 56 pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 12 gauge minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.

C. Fixtures weighing 56 Pounds or more: Install fixtures into suspension system and fasten earthquake clips to suspension system members as required by the Drawings and/or code. Install not less than 4 taut 2 gauge wires capable of supporting four times the fixture load.

3.07 CLEANING

A. General: After installation of acoustical material has been completed, clean all surfaces of the material, removing any dirt or discolorations. Replace panels as required.

B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.

3.08 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose off of the Project site.

B. Remove and replace damaged and stained acoustical ceiling panels with new panels.

3.09 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.10 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

B. Section 09 6700 - Resinous Flooring: Transitions between floor systems.

1.03 REFERENCE STANDARDS

A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile 2004 (Reapproved 2018).

B. ASTM F1344 - Standard Specification for Rubber Floor Tile 2015.

C. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.

D. ASTM F1859 - Standard Specification for Rubber Sheet Floor Covering Without Backing 2014, with Editorial Revision (2016).

E. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.

F. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant; Federal Specifications and Standards; Revision E, 1994.

1.04 SUMMARY

A. The Contractor shall furnish all labor, materials and services necessary to perform the work indicated on the drawings and as specified herein, as follows:

1. Clean and prepare concrete floor slabs and install new vinyl composition floor tile where indicated on the drawings.
2. Clean and prepare masonry wall construction and install new resilient wall base in all areas that receive new floor tile and areas scheduled to only receive rubber base.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions and maintenance instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Gardner Spencer Smith Tench and Jarbeau, PC's initial selection.

D. Verification Samples: Submit two full sized samples for each type, color and pattern of floor tile, wall base and accessories required.

E. Submit samples of all adhesives, underlayments and floor patch materials that will be used in this project. Samples shall be clearly labeled and shall be submitted in the smallest original container available from the manufacturer.

F. Concrete Testing Standard: Submit a copy of ASTM F710.

G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

I. Maintenance Materials: Furnish the following for Union County Commissioner's Office's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall protect the building, paving, utilities and other construction from damage due to the work.

B. The Contractor shall restore all damaged areas to original condition.

C. The Contractor shall protect new finished flooring, base and accessories from staining, marring and other physical damage as work progresses.

1.07 FIELD CONDITIONS

A. Maintain temperature in spaces to receive resilient materials at between 65 and 90 degrees F for not less than 48 hours before, during, and not less than 48 hours after installation.

B. Except as specified above, maintain the temperature of the work place at a minimum of 55 degrees F for the duration of the project.

C. Contractor shall notify the Union County Commissioner's Office and Gardner Spencer Smith Tench and Jarbeau, PC if the building temperature does not conform to these requirements.

D. Materials shall be stored on the jobsite under installation conditions for a minimum of 48 hours prior to installation.

1.08 EXTRA MATERIALS

A. See Division 01 - Product Requirements, for additional provisions.

B. Vinyl Composition Tile: Furnish not less than 20 tiles, for each type, color and pattern of tile installed.

C. Resilient Base: 20 linear feet of base and twenty premolded external corners.

1.09 COORDINATION

A. The Contractor shall be required to coordinate the work in accordance with the following:
   1. The Contractor shall prepare a tentative schedule of activities after receipt of the "notice of award", for review by the Union County Commissioner's Office and Gardner Spencer Smith Tench and Jarbeau, PC. The Contractor shall make any reasonable modifications to this schedule requested by the Union County Commissioner's Office and Gardner Spencer Smith Tench and Jarbeau, PC.
   2. The Contractor shall coordinate with the Union County Commissioner's Office and Gardner Spencer Smith Tench and Jarbeau, PC prior to commencing the work, so the work performed by the Union County Commissioner's Office or testing firms under contract with Gardner Spencer Smith Tench and Jarbeau, PC can be scheduled.

1.10 ASBESTOS PROIBITED

A. The Union County Commissioner's Office states that the use of asbestos-containing materials or products in the construction and/or renovation of buildings for Union County Commissioner's Office is expressly prohibited per CFR 126 1101 (b) (definitions): Asbestos includes Chrysotile, Amosite, Crocidolite, Tremolite, Anthophylite, Actinolite asbestos, and any of these minerals that have been chemically treated and/or altered. By signing this Contract, the Contractor warrants that all materials and products used in the prosecution of the work for this project are asbestos-free. Should it be determined, at any time, that the Contractor installed asbestos-containing material or products, the Contractor shall be required to remove and replace all such items at his own expense. Replacement work shall be accomplished in a timely manner on a schedule acceptable to the Union County Commissioner's Office.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness, and:
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Products shall be from one production run.
   3. Type: Tile shall be Imperial Texture Standard Excelon vinyl composition floor tile as manufactured by Armstrong World Industries, Inc. meeting the requirements of ASTM 1066, or an equivalent product from other acceptable manufacturers as listed herein.
   4. Size: 12 x 12 inch.
   5. Thickness: 0.125 inch.
   6. Colors:
      a. Field color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC with Union County Commissioner's Office's approval from the manufacturer's standard colors.
      b. Pattern and border colors: As selected Gardner Spencer Smith Tench and Jarbeau, PC with Union County Commissioner's Office's approval from the manufacturer's standard colors.
   7. Fire Test Data:
      a. ASTM E648 Critical Radiant Flux - 0.45 Watts/sq. cm. or more - Class 1.
      b. ASTM E 662 Smoke - 450 or less.
   8. Manufacturers:
      a. Basis of Design: Armstrong World Industries, Inc: www.armstrong.com.
      b. Mannington Mills, Inc: www.mannington.com.
      c. Johnsonite, a Tarkett Company: www.johnsonite.com.
         1) Includes Azrock Floor Products and Tarkett Floor Products
      d. Substitutions: See Division 01 - Product Requirements.

B. Luxury Vinyl Tile: Surface pattern type, and as noted on the Drawings:
   1. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   2. Products shall be from one production run.
   3. Colors:
      a. Pattern and border colors: As selected Gardner Spencer Smith Tench and Jarbeau, PC with Union County Commissioner's Office's approval from the manufacturer's standard colors.
   4. Fire Test Data:
      a. ASTM E648 Critical Radiant Flux - 0.45 Watts/sq. cm. or more - Class 1.
      b. ASTM E 662 Smoke - 450 or less.
   5. Manufacturers:
      a. Basis of Design: Shaw Contract: www.shawcontract.com.
      b. Armstrong World Industries, Inc[<>]: www.armstrong.com.
      c. Mannington Mills, Inc: www.mannington.com.
      d. Johnsonite, a Tarkett Company: www.johnsonite.com.
      e. Substitutions: See Division 01 - Product Requirements.

2.02 RESILIENT BASE

A. Type: Resilient Base: Shall be Type TS, Thermoset Vulcanized Extruded Rubber Cove Base as manufactured by Armstrong World Industries, Inc., fully conforming to the requirements of ASTM F 1861, Group 1 (solid) or equivalent product from other acceptable manufacturers as listed herein. Base shall be constructed of first-quality materials properly vulcanized, and shall be smooth and free from imperfections which detract from its appearance.

1. Height: 4 inch.
2. Style: Cove
3. Thickness: 0.125 inch thick.
4. Finish: Satin.
5. Length: Roll.
6. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC with Union County Commissioner's Office's approval from the manufacturer's standard colors.
7. Accessories: Premolded external corners.
8. Fire Test Data:
    a. ASTM E 648 Critical Radiant Flux - 0.45 Watts/sq. cm. or more - Class 1.
    b. ASTM E 662 Smoke - 450 or less.
9. Adhesives: Armstrong S-725. For other acceptable resilient base manufacturers listed herein, use equivalent product as recommended in manufacturer's product data.
10. Manufacturers:
    a. Basis of Design: Roppe Corp[<>]: www.roppe.com.
    b. Armstrong World Industries, Inc: www.armstrong.com.
    c. Burke Flooring: www.burkemercer.com.
    d. Johnsonite, a Tarkett Company: www.johnsonite.com.
    e. Mannington Mills, Inc: www.mannington.com.
    f. Substitutions: See Division 01 - Product Requirements.

2.03 MATERIALS - TRANSITIONS

A. Type: All products shall be made from 100% first quality homogeneous virgin vinyl compounds.
1. Length: Roll.
2. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC with Union County Commissioner's Office's approval from the manufacturer's standard colors.
3. Fire Test Data:
    a. ASTM E 648 Critical Radiant Flux - 0.45 Watts/sq. cm. or more - Class 1.
    b. ASTM E 662 Smoke - 450 or less.
4. Adhesives: Adhesives for products specified herein shall be recommended by the manufacturer's product data for the installation conditions indicated.
5. Manufacturers:
    a. Basis of Design: BurkeMercer Flooring Products, Inc: www.burkemercer.com.
    b. Armstrong World Industries, Inc: www.armstrong.com.
    c. Johnsonite, Inc: www.johnsonite.com.
    d. Mannington Mills, Inc: www.mannington.com.
    e. Roppe Corp: www.roppe.com.
    f. Substitutions: See Division 01 - Product Requirements.
6. Schedule:
    a. VCT to Carpet: Mercer No. 710.
    b. VCT to painted or other limited thickness flooring: Mercer No. 633.
    c. Equivalent products from other manufacturers listed herein are also acceptable.

2.04 ACCESSORIES

A. Tile adhesive: Armstrong S-515 water-based/latex-resin high-moisture tile adhesive.

B. Tile Underlayments:
1. Armstrong S-194 Portland Cement based patch, tile underlayment and leveler.
2. Armstrong S-195 Underlayment Additive, mixed with the S-194.
3. Armstrong S-183 Fast setting Portland Cement based tile underlayment and floor patch.

C. Primer: Armstrong S-185 water-based/latex primer.

D. For other acceptable tile manufacturers specified herein, use the equivalent types of adhesives, underlayment and primer as recommended in the manufacturer's product data.

E. Floor Finish Materials:
   1. Floor Stripper: Stepoff or Bravo as manufactured by Johnson Wax Professional.
   2. Floor Sealer: Over and Under as manufactured by Johnson Wax Professional.
   3. Floor Polish: Show Place Wax as manufactured by Johnson Wax Professional.
   4. Floor finish substitutions are not permitted.

F. Crack Isolation Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile adhesive.
   1. Applications: Use in the following locations:
      a. Crack isolation joints for floors.
   2. Joint Manufacturer:
      a. Basis of Design: Schluter-Systems; Product DILEX-BT/-BT/O/-BTS: www.schluter.com.
      b. Other acceptable manufacturers: Profilpas and Construction Specialties, Inc.
      c. Substitutions: See Division 01 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.

C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

E. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

F. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION OF SUB-FLOORS:

A. The Contractor shall thoroughly examine all surfaces and notify Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office in writing of any conditions that would prevent the successful completion of the work. Starting preparation work shall indicate acceptance of sub-floor conditions.

B. The Contractor shall be responsible for the preparation of all sub-floors.
   1. Contractor shall inspect sub-floor prior to installation of sub-floor preparation products. All surfaces shall receive a thorough sweeping with a wire brush to remove all dusty, chalky, or flaky concrete. Follow sweeping with thorough vacuum cleaning.
   2. Test: Contractor shall notify Union County Commissioner's Office when sub-floor is clean, dry and ready for testing. Initial testing shall be performed prior to the application of floor preparation products, i.e., primers, patching and underlayment materials.
      a. Union County Commissioner's Office shall secure and pay for the services of an independent testing agency to perform the test listed below. Union County Commissioner's Office shall determine quantity and locations of test.
      b. Alkalinity: The sub-floor shall be tested for alkalinity. Sub-floors with a pH reading of 9 or greater shall be neutralized with either an acetic or muriatic acid solution followed by a thorough rising with water. Furnish copy of test results to Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office

prior to starting floor preparation work.

c. Surface Moisture: The sub-floor shall be tested for surface moisture. Surface moisture shall not exceed underlayment, floor patch and adhesive manufacturer's recommendations. As a minimum, moisture shall not exceed 3 lbs./1000s.f./24 hours or manufacturer's requirements which ever is most stringent, as measured by means of a "Calcium Chloride Test", ASTM F 1869. Furnish copy of test results to Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office prior to starting floor preparation work.

d. Sub-floor preparation work, as specified below, shall not proceed until test results indicate cleaned sub-floor is within specified limits of the Alkalinity and Surface Moisture test.

3. Sub-floor surfaces shall not vary more than 1/8" in any ten-foot dimension. Neither shall they very at a rate greater than 1/16" per running foot. Grind or install leveling compounds until this tolerance is achieved.
4. Remove sub-floor ridges and bumps. Fill slab control joints, minor low spots, cracks, holes and other defects with tile underlayment and floor patch material, such as Armstrong S-183 fast setting tile underlayment floor patch, to achieve smooth, flat and hard surfaces.
5. Prior to the installation of any leveling compound, the sub-floor shall be boom clean, mopped and dust mopped to remove all residue form removal of adhesive.
6. Allow floor to dry thoroughly prior to installing leveling compounds. Surface moisture shall not exceed adhesive manufacturer's recommendations. Compounds shall be installed in accordance with compound manufacturers written instructions.
7. When the thickness of the leveling compound required to level the floor exceeds 1/4", the Contractor shall install multiple layers. Installed layer shall be allowed to dry thoroughly prior to the installation of subsequent layers. Each layer shall not exceed 1/4" in thickness.
8. Prohibit foot traffic until underlayments are cured.

C. Incompatible Coatings: Remove coatings and other substances that are incompatible with adhesives. Remove by methods recommended by the manufacturer.

D. After the preparation work is completed, the sub-floor shall be broom clean, mopped and dust mopped until all materials that could telegraph through the new flooring are removed.

3.03 SUB-FLOOR INSPECTION

A. Concrete slab shall be smooth, sound, dry, clean and free of dirt and all foreign matter that interfere with a good bond.

B. Contractor shall inspect sub-flooring before installation of tile. Floor shall be completely dry prior to adhesive and tile installation.

1. Surface Moisture Test: Contractor shall notify Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office when prepared sub-floor is smooth, sound, dry, clean and ready for testing. Testing shall be performed prior to the application of primers and/or adhesives.
2. Surface Moisture Test shall be performed as specified above.
3. Installation work shall not proceed until test results indicate prepared sub-floor is within specified limits of Surface Moisture Test.

C. Contractor shall apply primer as specified herein where concrete floor slab surface shows conditions that might prevent proper bonding of adhesive. This shall be done in accordance with adhesive manufacturer's recommendations.

3.04 APPLICATION OF ADHESIVES

A. Apply adhesive in accordance with adhesive manufacturer's directions. Cover surface evenly with adhesive using a fine-notched trowel and application rate recommended by the adhesive manufacturer.

B. Following adhesive application, allow adequate "open time", per manufacturer's recommendations, prior to laying tile.

C. Do not exceed the adhesives maximum "working time" as defined and recommended by the manufacture. Consider job condition, temperature and humidity levels when determining actual adhesive "working time".

D. If adhesive "working time" is exceeded it shall be mechanically removed by scraping or grinding. The sub-floor shall be smooth, dry, clean and free of dirt and all foreign matter prior to recoating with adhesive.

3.05 INSTALLATION OF RESILIENT BASE AND VINYL TRANSITIONS

A. Install new resilient base in all areas receiving new flooring. Allow newly installed floor to sit for 48 hours prior to installing base.

B. Install new vinyl transitions where new flooring abuts existing floors of dissimilar material or thickness. Install vinyl transitions as floor tile installation progresses.

C. Center base work between walls. Except as required in irregularly shaped spaces, no base segment shall be less than 1/2 the standard length. Install pre-molded corners at all outside corners, wrapped base shall not be acceptable. Miter internal corners per manufacturer's installation recommendations.

D. Scribe and fit to door frames and other interruptions.

E. Transition strips shall be full length for opening under 12' in width. If length of edge to receive strip exceeds 12'. strips shall be spaced to provide equal lengths.

F. Base and transition strips shall be completely embedded in adhesives in such a manner as to prevent movement or sagging. A notched trowel or similar tool recommended for adhesives manufacturer shall be used for application.

3.06 INSTALLATION OF CRACK ISOLATION TRIM

A. Install crack isolation trim where indicated or at locations where the tile underlayments appear not to be adequate. Install crack isolation trim as floor tile installation progresses.

B. Trim shall run perpendicular to walls and over the largest portion of the cracking when possible.

C. Crack isolation trim shall be completely embedded in the tile underlayments and adhesives in such a manner as to prevent movement or sagging. A notched trowel or similar tool recommended for adhesives manufacturer shall be used for application.

3.07 CLEANING AND PROTECTION

A. Upon completion of resilient flooring and base installation clean the floors of all dirt and debris that could interfere with proper floor finish application. Remove excess adhesive from floor, base and wall surfaces without damaging finishes.

B. Do not wet wash, scrub or strip tile floor for at least five (5) days following installation.

C. Scrub the new floor tile to remove the factory-applied sealer by scrubbing with a blue scrubbing pad and water-rinse solution of Spartan's Shineline Emulsifier Plus stripper, diluted per the manufacturer's instructions. Thoroughly remove dirty solution with a wet/dry vacuum after scrubbing action is complete.

1. For ALL existing VCT remove coatings with Spartan's Shineline Emulsifier Plus stripper as recommended by the manufacturer.

D. Thoroughly rinse the floor with two (2) rinses of clear water. Floor must dry completely before moving to next step.

E. Apply two (2) coats of Spartan's Shineline Sealer in accordance with the manufacturer's specifications. Allow adequate drying time between coats, as specified by the manufacturer. Forced drying with fans or any other means is prohibited.

F. Apply four (4) coats of Spartan's Dura Gloss floor finish in accordance with the manufacturer's specifications. The film of wax shall be applied with a rayon waxing mop in generous, uniform film to prevent streaking. Allow adequate drying between coats as specified by the

manufacturer. Forced drying with fans or any other means is prohibited.

G. After the floor finish has cured in accordance with the manufacturer's specifications, burnish the floor finish with high-speed burnisher to harden the floor finish surface and produce a "wet look" sheen.

H. The Contractor shall notify Union County Commissioner's Office during the cleaning, scrubbing, sealing and waxing stages of the floor finish process for assistance and consultation as required to achieve the specified finish.

I. Upon completion of the Contractor's Resilient Flooring work, Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office will conduct a "Punch List" documenting work to be finished, work not in compliance with the Contract Documents, work damaged, etc.

J. Union County Commissioner's Office will move furniture and equipment into the rooms. Upon completion of the moving of furniture and equipment the Contractor will thoroughly clean, light scrub, and apply two additional coats of Spartan's Dura Gloss floor finish on all corridor floors and clean and burnish all classroom floors and other areas scheduled to receive Resilient Flooring.

3.08 INSTALLATION, GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.09 TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.

3.10 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.11 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

3.12 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.13 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Division 01.

B. Provide free access to testing operations at project site and cooperate with appointed firm.

END OF SECTION

SECTION 09 6700
RESINOUS FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. High-performance resinous flooring .

1.02 RELATED SECTIONS

A. Section 03 3000 - Cast-In-Place Concrete: For concrete substrates to receive resinous flooring.

B. Section 07 9005 - Joint Sealers: Joint between base and wall surface.

1.03 REFERENCES

A. ASTM D 905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2003.

B. ASTM D 4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2001.

C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2004.

D. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials; 2000.

E. C-307 Test Method for Tensile Strength of Chemical-Resistant Mortars.

F. C-501 Test Method for Relative Resistance to Wear Unglazed Ceramic Tile by Taber Abraser.

G. C-531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.

H. C-579 Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfaces.

I. C-580 Test Methods for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.

J. C-884 Test Method for Thermal Compatibility Between Concrete and an Epoxy Resin Overlay.

K. D-570 Water Absorption of Plastics.

L. D-695 Compressive Properties of Rigid Plastic.

M. D-1308 Test Method for Effect of Chemicals on Clear and Pigmented Organic Finishes.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available ; and recommendations for each resinous flooring component required.

C. Samples for Initial Selection: For each type of exposed finish required.

D. Samples for Verification: Of each resinous flooring system required, 6 inches (150 mm) square, applied by Installer for this Project to a rigid backing, in color, texture, and finish indicated. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

E. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base and termination details, and details at floor material transitions and where adjoining equipment.
   1. Locate and provide detailing for flexible joints required for flooring in area of installation.

F. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

G. Material Certificates: In lieu of material test reports, when permitted by Gardner Spencer Smith Tench and Jarbeau, PC, signed by manufacturers certifying that materials furnished comply with requirements.

H. Manufacturer's Installation Instructions: Indicate special procedures.

I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Engage an experienced installer (applicator) who has specialized in installing resinous flooring similar in material, design, and extent to that indicated for this Project and who is acceptable to resinous flooring manufacturer.
   1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to install resinous flooring systems specified.
   2. Installer to verify locations of all flexible joints required by the provisions of this Section and the recommendations of the related material manufacturers.
      a. Joint locations may or may not be shown in drawings.
      b. Refer to drawings required under Submittals above.

C. Source Limitations: Obtain primary resinous flooring material including primers, resins, hardening agents, and sealing or finish coats, through one source from one manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

D. Field Samples: On floor area selected by Gardner Spencer Smith Tench and Jarbeau, PC, provide full-thickness resinous flooring system samples that are at least 48 inches (1200 mm) square to demonstrate texture, color, thickness, chemical resistance, cleanability, and other features of each resinous flooring system required. Simulate finished lighting conditions for review of in-place field samples.
   1. If field samples are unacceptable, make adjustments to comply with requirements and apply additional samples until field samples are approved.
   2. After field samples are approved, these surfaces will be used to evaluate resinous flooring.
   3. Obtain Gardner Spencer Smith Tench and Jarbeau, PC’s approval of field samples before applying resinous flooring.

E. Supervisor Qualifications: Trained by product manufacturer , under direct full time supervision of manufacturer's own foreman.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer’s labels indicating brand name and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer’s written instructions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

C. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Environmental Limitations: Comply with resinous flooring manufacturer’s written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring installation.

B. Lighting; Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring installation.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

D. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

E. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation.
   1. Resinous Flooring RES-1: Where this designation is indicated, provide resinous flooring system complying with one of the following:
      a. Basis of Design: Stonhard; Product: Stontec ERF: www.stonhard.com.
      b. Citadel Floor Finishing Systems by Rust-Oleum Corporation: www.citadelfloors.com.
      c. Elite Crete Systems: www.elitecrete.com.
      d. Key Resin Company: www.keyresin.com.
      e. Sika Corporation: www.sikafloorusa.com.
      f. Substitutions: See Section 01 6000 - Product Requirements.
   2. Color and Pattern: Gardner Spencer Smith Tench and Jarbeau, PC to select from manufacturer’s full range.
   3. System Characteristics:
      a. Wearing Surface: Standard
   4. System Components: Manufacturer's standard components that are compatible with each other and as follows:
      a. Primer:
         1) Material Basis: Stonhard Standard Primer
         2) Resin: Epoxy
         3) Formulation Description: (2) two component 100 percent solids.
         4) Application Method: Squeegee and roller.
         5) Number of Coats: (1) one.
         6) Aggregates: Broadcast quartz into wet primer coat.
   5. Body Coat(s):
      a. Material Basis: Stonshield Undercoat.
      b. Resin: Epoxy.
      c. Formulation Description: (3) three component solvent free epoxy.
      d. Application Method: Notched squeegee.
         1) Thickness of Coats: 25-30 mils with standard primer coat
         2) Number of Coats: (1) One.
   6. System Thickness: 0 5/64-inch (2 mm).
   7. Base: 4-inch (100-mm) high integral cove base.

2.02 MATERIALS

A. Resinous Flooring: Resinous floor surfacing system consisting of primer; body coat(s) including resin, hardener, aggregates, and colorants, if any; and sealing or finish coat(s). Comply with requirements indicated in the Resinous Flooring Schedule.
   1. Reinforcing Membrane: Manufacturer’s flexible resin recommended for crack isolation to help prevent substrate cracks from reflecting through resinous flooring.

2. Moisture Vapor Membrane: Manufacturer's recommended two-part epoxy moisture vapor membrane to reduce the passage of water vapor and moisture through concrete slabs.

B. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

C. Joint Sealant: Type recommended or provided by resinous flooring manufacturer for type of service and joint condition indicated.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.

C. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. General: Prepare and clean substrate according to resinous flooring manufacturer’s written instructions for substrate indicated. Provide clean, dry, and neutral substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminates incompatible with resinous flooring.
   1. Comply with ASTM C 811 requirements, unless manufacturer’s written instructions are more stringent.
   2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer’s written recommendations.
   3. Test for moisture for moisture vapor emission; install no flooring over concrete until the slabs have been cured and are sufficiently dry to achieve permanence with coating as determined by material manufacturer's recommended bond and moisture vapor test.
      a. Air drying: After completion of cleaning, allow concrete surface to air dry thoroughly prior to application of the floor surfacing. Blowers or oil free compressed air may be used. Do not use flame drying methods. Prior to application of surfacing, the concrete surface shall be tested for excessive moisture vapor in at least two locations using the calcium chloride test kit. The testing procedure should follow the requirements outlined in ASTM-F-1869-98. If test indicate an excessive level of moisture vapor at either location, additional air drying shall be undertaken until such time as additional tests show acceptable results.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer’s written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer’s written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer’s written recommendations.

F. All cracks to be routed out for 1/4-inch minimum in width and depth and filled with an elastomeric joint compound. All areas in which installed overlayment does not abut against vertical surface shall be chased. Chase shall be 3/4-inch wide with out-side edge chiseled to a straight saw cut with a minimum depth of 1/2-inch.

G. Coat entire area to receive resinous flooring with a two-part epoxy moisture vapor membrane to reduce the passage of water vapor and moisture through concrete slabs.

H. Vacuum clean substrate.

3.03 INSTALLATION - FLOORING

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
   1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate and optimum intercoat adhesion.
   2. Cure resinous flooring components according to manufacturer’s written instructions. Prevent contamination during application and curing processes.
   3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer’s written instructions.
      a. Apply joint sealant to comply with manufacturer’s written recommendations.

B. Apply epoxy moisture vapor membrane in all areas that are scheduled to receive resinous flooring.

C. Apply primer over prepared substrate as required by manufacturer.

D. Apply reinforcing membrane to substrate cracks.

E. Apply self-leveling slurry body coat(s) in thickness indicated.
   1. Broadcast aggregates and, after resin is cured, remove excess aggregates to provide surface texture indicated.

F. Apply troweled or screened body coat(s) in thickness indicated. Hand or power trowel and grout to fill voids. When cured, sand to remove trowel marks and roughness.

G. Integral Cove Base: Apply cove base mix to wall surfaces at locations indicated. Round internal and external corners. Install cove base according to manufacturer’s written instructions and details including taping, mixing, priming, troweling, sanding, and topcoating of cove base.

H. Apply sealing or finish coat(s), including grout coat, if any, of type recommended by resinous flooring manufacturer to produce finish indicated. Apply in number of coats and at spreading rates recommended in writing by manufacturer.

I. Cove at vertical surfaces.

3.04 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

3.05 CLEANING

A. Clean resinous flooring not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each Project area. Use cleaning materials and procedures recommended in writing by resinous flooring manufacturer.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished

D. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Gardner Spencer Smith Tench and Jarbeau, PC will select from standard colors and finishes available.
   1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

E. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically so indicated.
   9. Ceramic and other tiles.
   10. Exterior insulation and finish system (EIFS).
   11. Glass.
   12. Acoustical materials, unless specifically so indicated.
   13. Concealed pipes, ducts, and conduits.

F. See Schedule - Surfaces to be Finished, at end of Section.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Shop-primed items.

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

B. Exposed Surfaces: Includes areas visible when permanent or built-in components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

C. Standard coating terms defined in ASTM D 16 apply to this Section.
   1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
   4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2016.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.

D. NACE (IMP) - Industrial Maintenance Painting; NACE International; Edition date unknown.

E. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on all finishing products, including VOC content.
   1. Provide cross-referenced data indicating equivalency of any proposed paint systems other than basis of design paint systems. Provide data indicating substrate material, vehicle type, per cent solids by weight, per cent solids by volume, dry film thickness, viscosity, specular gloss, and VOC/VOS content for each type material.

C. Samples: Submit two paper chip samples, 12 x 12 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.

D. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
   1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color and texture are achieved.
   2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
   3. Submit Samples on the following substrates for Gardner Spencer Smith Tench and Jarbeau, PC's review of color and texture only:
      a. Concrete: 4-inch square Samples for each color and finish.
      b. Concrete Unit Masonry: 4-inch square Samples of masonry, with mortar joint in the center, for each finish and color.
      c. Painted Wood: 8-inch square Samples for each color and material on hardboard.
      d. Stained or Natural Wood: 4-inch square Samples of natural or stained wood finish on representative surfaces.
      e. Ferrous Metal: 4-inch square Samples of flat metal and 8-inch long Samples of solid metal for each color and finish.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

C. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

B. Existing paint surfaces may contain lead. Prior to execution of the work, test existing paint materials to be removed and abate all contaminated materials. Conform to applicable codes and regulations for the legal removal and disposal of existing lead based paints. Protect all persons, structures, and building systems from exposure to contaminants.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 COORDINATION

A. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Gardner Spencer Smith Tench and Jarbeau, PC about anticipated problems when using the materials specified over substrates primed by others.

1.11 EXTRA MATERIALS

A. See Division 01 - Product Requirements, for additional provisions.

B. Supply 5 gallons of each color; store where directed.

C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Paints:

1. Basis of design: PPG Architectural Coatings (PPG): www.ppgpro.com.
2. Benjamin Moore & Co (BM): www.benjaminmoore.com.
3. Sherwin-Williams Company (SW): www.sherwin-williams.com.

C. Substitutions: See Division 01 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each coating material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: Match Gardner Spencer Smith Tench and Jarbeau, PC's samples.
   1. Proprietary Names: Use of manufacturer's proprietary product color names and product numbers to designate colors is not intended to imply that products named are required to be used to the exclusion of other listed manufacturers.
   2. Acceptance of colors, as an aesthetic effect, is judged solely by Gardner Spencer Smith Tench and Jarbeau, PC.

D. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

E. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS - EXTERIOR

A. Concrete, Portland Cement Plaster and Masonry other than CMU and Brick (Semi-gloss):
   1. Primer (New) - 1 coat applied at DFT of no less than 1.5 mils or as recommended by manufacturer:
      a. PPG: 4-603XI Perma Crete Int/Ext Alkaline Resistant Primer.
      b. BM: Moore’s High Build Acrylic Masonry Primer 068.
      c. SW: Loxon Masonry Primer A24W300.
   2. Primer (Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
      a. PPG: 17-921XI Seal Grip Interior Exterior Acrylic Universal Primer.
      b. BM: Moore’s Fresh Start Interior Exterior Acrylic Primer 023.
      c. SW:PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
   3. Finish - 2 coats applied at total DFT of no less than 2.8 mils or as recommended by manufacturer:
      a. PPG: 6-900XI Speedhide Exterior Acrylic Semi-Gloss.
      b. BM: Super Spec Latex Semi Gloss House & Trim paint K170 Series.
      c. SW:A-100 Exterior Acrylic Latex Gloss A8 Series.

B. Plywood/T1-11 (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
      a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
      b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
      c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
   2. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
      a. PPG: 649-10 Series, Acri-Shield Max, Exterior 100% Acrylic Latex Semi-Gloss.
      b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
      c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

C. Wood and Cement Board Siding (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
      a. PPG: 4-603XI Perma-Crete, 100% Acrylic Latex, Interior/Exterior Alkali Resistant Primer.
      b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
      c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
   2. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
      a. PPG: 649-10 Series, Acri-Shield Max, Exterior 100% Acrylic Latex Semi-Gloss.
      b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
      c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

D. Ferrous Metal (Semi-gloss):
   1. Primer (New or Shop Primed) - 1 coat applied at DFT of no less than 2.3 mils or as recommended by manufacturer:
      a. PPG: 6-208 Speedhide Int/Ext Rust Inhibitive Steel Primer.
      b. BM: Super Spec HP Alkyd Metal Primer P06 Series.
      c. SW: Kromik Alkyd Metal Primer E41 Series.
   2. Primer (Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
      a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
      b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
      c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
   3. Finish - 2 coats applied at total DFT of no less than 4.0 mils or as recommended by manufacturer:
      a. PPG: 90-474Pitt-Tech Waterborne Acrylic DTM Satin Enamel.
      b. BM: Super Spec HP DTM Acrylic Semi-Gloss Enamel P29 Series.
      c. SW: DTM Acrylic Semi-Gloss Enamel B66W200.

E. Galvanized Metal (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 2.0 mils or as recommended by manufacturer:
      a. PPG: 90-712 Pitt-Tech DTM Acrylic Metal Primer Finish.
      b. BM: Super Spec HP Acrylic Metal Primer P04.
      c. SW: DTM Acrylic Primer Finish B66W1 Series.
   2. Finish - 2 coats applied at total DFT of no less than 4.0 mils or as recommended by manufacturer:
      a. PPG: 90-474Pitt-Tech Waterborne Acrylic DTM Satin Enamel.
      b. BM: Super Spec HP DTM Acrylic Semi-Gloss Enamel P29 Series.
      c. SW: DTM Acrylic Semi-Gloss Enamel B66W200.

F. Wood Trim - Staining Woods:
   1. Stain Coat:
      a. PPG: FLD565, Flood Pro Series, Flood CWF-UV5 Penetrating Wood Finish.
      b. BM: Arbocoat, Exterior Transparent Stain.
      c. SW: Super Deck, Exterior Transparent Stain.
   2. Finish - (2 coats):
      a. PPG: FLD565, Flood Pro Series, Flood CWF-UV5 Penetrating Wood Finish.
      b. BM: Arbocoat, Exterior Transparent Stain.
      c. SW: Super Deck, Exterior Transparent Stain.

2.04 PAINT SYSTEMS - INTERIOR

A. Plywood/T1-11 (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
      a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
      b. BM: Moore’s Fresh Start Interior Exterior Acrylic Primer 023.
      c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
   2. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
      a. PPG: 919-10 Advantage 900 Interior Exterior Acrylic Semi-Gloss Enamel.
      b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
      c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

B. Ferrous Metal (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 2.3 mils or as recommended by manufacturer:
      a. PPG: 6-208 Speedhide Int/Ext Rust Inhibitive Steel Primer.
      b. BM: Super Spec HP Alkyd Metal Primer P06 Series.
      c. SW: Kromik Alkyd Metal Primer E41 Series.
   2. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
      a. PPG: 919-10 Advantage 900 Interior Exterior Acrylic Semi-Gloss Enamel.
      b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
      c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

C. Galvanized Metal (Semi-gloss):
   1. Primer (New and Previously Painted) - 1 coat applied at DFT of no less than 2.0 mils or as recommended by manufacturer:
      a. PPG: 90-712 Pitt-Tech DTM Acrylic Metal Primer Finish.
      b. BM: Super Spec HP Acrylic Metal Primer P04.
      c. SW: DTM Acrylic Primer Finish B66W1 Series.
   2. Finish: 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
      a. PPG: 919-10 Advantage 900 Interior Exterior Acrylic Semi-Gloss Enamel.
      b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
      c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

D. Gypsum Board (Flat):
   1. Primer (New) - 1 coat applied at DFT of no less than 1.0 mils or as recommended by manufacturer:
      a. PPG: 6-2 Speedhide Interior Latex Drywall Primer/Sealer.
      b. BM: Super Spec Interior Latex Primer 253.
      c. SW: Prep-Rite 200 Interior Latex Primer B28W200.

2. Primer (Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
    a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
    b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
    c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
3. Finish - 2 coats applied at total DFT of no less than 2.6 mils or as recommended by manufacturer:
    a. PPG: 6-70 Speedhide Interior Latex Flat Wall Paint.
    b. BM: Super Spec Interior Latex Flat Wall Paint 275.
    c. SW: Pro-Mar 200 Interior Flat Latex Wall Paint B30 Series.

E. Gypsum Board (Eggshell):
1. Primer (New) - 1 coat applied at DFT of no less than 1.0 mils or as recommended by manufacturer:
    a. PPG: 6-2 Speedhide Interior Latex Drywall Primer/Sealer.
    b. BM: Super Spec Interior Latex Primer 253.
    c. SW: Prep-Rite 200 Interior Latex Primer B28W200.
2. Primer (Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
    a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
    b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
    c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
3. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
    a. PPG: 6-411 Speedhide Interior Latex Eggshell Enamel.
    b. BM: Super Spec Interior Latex Eggshell Enamel 274.
    c. SW: Pro-Mar 200 Interior Lo-Sheen Latex Enamel B20 Series.

F. Gypsum Board (Semi-gloss):
1. Primer (New) - 1 coat applied at DFT of no less than 1.0 mils or as recommended by manufacturer:
    a. PPG: 6-2 Speedhide Interior Latex Drywall Primer/Sealer.
    b. BM: Super Spec Interior Latex Primer 253.
    c. SW: Prep-Rite 200 Interior Latex Primer B28W200.
2. Primer (Previously Painted) - 1 coat applied at DFT of no less than 1.6 mils or as recommended by manufacturer:
    a. PPG: 17-921XI Seal Grip Interior Exterior Universal Acrylic Primer.
    b. BM: Moore's Fresh Start Interior Exterior Acrylic Primer 023.
    c. SW: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer B51-600 Series.
3. Finish - 2 coats applied at total DFT of no less than 3.0 mils or as recommended by manufacturer:
    a. PPG: 919-10 Advantage 900 Interior Exterior Acrylic Semi-Gloss Enamel.
    b. BM: Moore's Kitchen & Bath Acrylic Enamel 322.
    c. SW: ProClassic Acrylic Semi-Gloss Enamel B31 series.

G. Wood Trim - Staining Woods:
1. Stain Coat:
    a. PPG: Deft Oil Based Wood Stain DFT400 Series.
    b. BM: Benwood Interior Oil Wood Stain 241.
    c. SW: Wood Classics Interior Oil Stain A48-200 series.
2. Sealer Coat:
    a. PPG: Deft Sanding Sealer Interior Water Based DFT61.
    b. BM: Benwood Quick Drying Sanding Sealer 413.
    c. SW: Wood Classics FD Sanding Sealer B26 series.

3. Finish - (2 coats):
    a. PPG: Deft Polyurethane Interior Oil Based 350 g/L - (Satin) DFT129 (Gloss) DFT127.
    b. BM: Benwood Interior Satin Varnish C404, Gloss Impervo C440.
    c. SW: Wood Classics FD Varnish A66 Series.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
    1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
    2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the tobil system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
    1. Notify Gardner Spencer Smith Tench and Jarbeau, PC about anticipated problems when using the materials specified over substrates primed by others.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
    1. Gypsum Wallboard: 12 percent.
    2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
    3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. General: For all existing surfaces to be repainted, prepare mockup area for prior approval. Area shall be minimum 8' x 8' and retained for duration of the work as example of acceptable workmanship. Methods for preparation of the existing surfaces shall be as recommended by the paint manufacturer and Architect to produce acceptable results and by any means necessary including, but not limited to, chemical and mechanical treatments.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

F. Seal surfaces that might cause bleed through or staining of topcoat.

G. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

H. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

I. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

J. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

K. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

L. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

M. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

O. Previously Painted Surfaces:
   1. Paint only clean, dry surfaces.
   2. Remove all surface contaminants to include mold, mildew, dirt, dust, oil, grease, mill scale, wax, chalk or oxidation, efflorescence, rust, mortar, and any other foreign matter existing on the surface.
   3. Scrape or use appropriate means to remove all loose, peeling, flaking, or marginally adhering paint from the surface. Feather sand edges as necessary.
   4. Repair or replace caulking where needed.
   5. After cleaning, glossy surfaces shall be dulled by sanding. Remove all sanding dust from the surface after sanding has taken place. Prepare bare areas as new surfaces, and spot prime or fill those bare areas with the appropriate primer or filler.
   6. Patch or repair any cracks or voids with the appropriate patching compound and sand smooth as necessary.
   7. Spot prime any patched areas with the appropriate primer prior to finishing.
   8. If after cleaning chalky surfaces chalk residue is still present, prime the entire surface with the proper bonding primer to insure good adhesion of the topcoat to the substrate.

3.03 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
   1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
   2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
   3. Provide finish coats that are compatible with primers used.
   4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   5. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
   6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
8. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
   1. The number of coats arid film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
   2. Omit primer over metal surfaces that have been shop primed and touchup painted.
   3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
   4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
   1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
   2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
   3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Fire Walls: Where fire walls run above suspended ceilings, paint by stenciling "Fire and Smoke Barrier-Protect All Openings" on wall surfaces.
   1. Make height of characters 6-inches high or as required by governing authorities.
   2. Space stenciling at 20'-0" o.c but not less than one stenciling on each wall or as required by governing authorities.

F. Apply products in accordance with manufacturer's instructions.

G. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

H. Apply each coat to uniform appearance.

I. Sand wood and metal surfaces lightly between coats to achieve required finish.

J. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 23 and Division 26 for schedule of color coding of equipment, duct work, piping, and conduit.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.

D. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.06 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

C. Provide “Wet Paint” signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

3.07 SCHEDULE - SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically noted.
   2. Fire rating labels, equipment serial number and capacity labels.
   3. Stainless steel items.

B. Paint the surfaces described below under Schedule - Paint Systems.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
   1. Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, and mechanical equipment, electrical equipment, and tanks that do not have factory-applied finishes occurring in finished areas to match background surfaces, unless otherwise indicated.
   2. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
   3. Paint shop-primed items occurring in finished areas.
   4. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
   5. Paint dampers exposed behind louvers, grilles, to match face panels.
   6. Paint electrical switchgear, panelboards and miscellaneous equipment that is indicated to have a factory-primed finish for field painting.

D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
   1. Provide satin finish for final coats.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

J. A maximum of (20) twenty paint colors will be selected by Gardner Spencer Smith Tench and Jarbeau, PC.

3.08 MAINTENANCE MATERIALS

A. Furnish a minimum of 5 gallons of each paint color, type and finish used on the Project as Union County Commissioner's Office's Attic Stock. Store materials at location designated by Gardner Spencer Smith Tench and Jarbeau, PC.

B. Properly Identify each container with manufacturer, color name, product number, color formula and general location in the Project.

3.09 SCHEDULE - PAINT SYSTEMS

A. Concrete, Concrete Block, Brick Masonry: Finish all surfaces exposed to view.
   1. Exterior: Semi-gloss.
   2. Interior: Semi-gloss.

B. Gypsum Board: Finish all surfaces exposed to view.
   1. Walls: Semi-gloss.
   2. Interior Soffits: Flat.
   3. Interior Ceilings at Toilet Areas: Semi-gloss.

C. Wood: Finish all surfaces exposed to view.
   1. Waterborne Stain Satin-Varnish Finish: Two finish coats of waterbome clear satin varnish over a sealer coat and waterborne interior wood stain. Wipe wood filler before applying stain.
      a. Filler Coat: Open-grain wood filler.
      b. Stain Coat: Interior wood stain.
      c. Sealer Coat: Clear sanding sealer.
      d. Finish Coats: Interior waterborne clear satin varnish.

D. Steel Doors and Frames: Finish all surfaces exposed to view.
   1. Exterior: Semi-gloss.
   2. Interior: Semi-gloss.

E. Steel Fabrications: Finish all surfaces exposed to view.
   1. Exterior: Gloss; finish all surfaces, including concealed surfaces, before installation.
   2. Interior: Gloss.
   3. Interior exposed ceiling structural, mechanical, electrical systems: Flat.

F. Galvanized Steel: Finish all surfaces exposed to view.
   1. Exterior: Semi-gloss.
   2. Interior: Semi-gloss.

G. Shop-Primed Metal Items: Finish all surfaces exposed to view.
   1. Finish the following items:
      a. Exposed surfaces of lintels.
      b. Elevator pit ladders.
      c. Exposed surfaces of steel stairs and railings.
      d. Mechanical equipment.
      e. Electrical equipment.
   2. Exterior: Gloss.

3. Interior: Gloss.

END OF SECTION

SECTION 10 2175
PHENOLIC CORE PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid Phenolic Toilet Compartments.

1.02 RELATED SECTIONS

A. Section 10 2810 - Toilet Accessories.

1.03 REFERENCES

A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.

1.04 SYSTEM DESCRIPTION

A. Design Requirements: Design and fabrication shall conform to requirements of ADA.

B. Toilet Compartments:
   1. Floor supported overhead braced type units consisting of solid phenolic pilasters, panels and doors; plated steel leveling devices with stainless steel covers; aluminum overhead bracing, and stainless steel fittings, hardware and fastenings necessary for complete installation.

1.05 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Submit Shop Drawings indicating complete layout, elevations of partitions, thickness of solid phenolic panels, fastenings, proposed method of anchoring, size and spacing of anchors, details of construction, hardware, fittings, mountings, method of assembly, other related items, and installation details.

C. Product Data: Submit manufacturer's technical data for materials, fabrication, finishing, fastenings, hardware, and installation details.
   1. Manufacturer's complete range of colors.

D. Material Samples:
   1. Submit full range of Samples of phenolic chips for initial color selection. Chips shall be at least 2 inches x 3 inches.
   2. Submit Samples of hardware and fasteners.

E. Certificates: Furnish manufacturer's certification that materials meet or exceed Specification requirements.

1.06 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:
   1. ASTM A167-92b: Stainless and Heat Resisting Chromium Nickel Steel Plated
   2. ASTM E 84-91a: Surface Burning Characteristics of Building Materials
   3. Chemical Resistance: Panels to meet or exceed Scientific Equipment Furniture Association’s (S.E.F.A.) list of 49 standard chemicals.
   4. Consistency:
      a. Panels to have uniform thickness (+0.03”).
      b. Panels to have uniform flatness (maximum difference of 0.03”) for 10’ span.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site with manufacturer's labels intact and legible, in sealed containers. Materials shall be kept dry.

B. Provide all means necessary to protect compartments and screens.

1.08 PROJECT/SITE CODITIONS:

A. Install toilet partitions after plumbing fixtures and floor, wall and ceiling finishes have been installed.

1.09 COORDINATION

A. Field Measurements: Secure field measurements before preparation of Shop Drawings and fabrication where possible, for proper and adequate fabrication and installation of the Work of this section.

B. Furnish inserts and anchorage built into other construction for installation of toilet compartments and urinal screens.

C. Coordinate masonry wall construction so that masonry unit cells are filled with grout at points where toilet partition mounting brackets, support framing and anchors in wall will be located.

1.10 WARRANTY

A. Manufacturer's Special Warranty: Written warranty made out to Union County Commissioner's Office and signed by manufacturer guaranteeing its plastic against breakage, corrosion, and delamination under normal conditions. If materials are found to be defective during the warranty period for reasons listed above, the materials will be replaced free of charge.
   1. Manufacturer shall provide a 10 year material warranty from date of substantial completion.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Solid Phenolic Panels:
   1. Accurate Partitions Corp: www.accuratepartitions.com.
   2. Ampco Products, Inc: www.ampco.com.
   3. Bobrick Washroom Equipment, Inc: www.bobrick.com.
   4. General Partitions MFG. Corp: www.generalpartitions.com.
   5. Global Products Corp: www.globalpartitions.com.
   6. Substitutions: See Division 01 - Product Requirements.

2.02 COMPARTMENTS

A. Toilet Compartments: Solid Phenolic.
   1. Floor/Wall Mounted: Overhead-braced partitions.

2.03 MATERIALS

A. Compartment panels:
   1. Core: Phenolic color-thru impregnated Kraft papers with consistent matching color throughout the core. Panel shall be at least 93 pounds per cubic foot to ensure full saturation of Kraft core.
   2. Fire Resistance: The panels shall have the following surface burning characteristics and smoke generation values in accordance with UL classification and labeling in accordance with ASTM E 84 tests and shall be self-extinguishing.
      a. Flame spread: Maximum 30 for 3/4 inch thick panels; 30 for 1/2 inch thick panels.
      b. Smoke developed: Maximum 70 for 3/4 inch thick panels; 85 for 1/2 inch thick panels.
   3. Panels shall be UL registered and labeled.
   4. Panel shall be resistant to cleaning solvents and uric acid.
   5. Product/Material Specification:
      a. Modulus of Elasticity: 1.5 million psi minimum
      b. Shear Strength: 2,000 psi minimum
      c. Compressive strength: 24,000 psi minimum.
      d. Water Absorption: 3% maximum
      e. Use Temperature: 350° F maximum

f. Surface and Edges: Non-porous
g. Material Resistance: Will not support fungus or bacteria
h. Uniform Load Deflection: 1/4” maximum

B. Stainless Steel: ASTM A167, Type 304.

C. Concealed Fasteners and Leveling Devices: Zinc or cadmium coated steel.

D. Shower Accessories and Seat: See Section 10 2810 - Toilet Accessories.

2.04 CHARACTERISTICS

A. Doors shall be minimum 3/4 inch thick, panels minimum 1/2 inch thick, pilasters minimum 3/4 inch thick and screens minimum 1/2 inch thick. Edges shall be machined to a radius of 0.125 inch; exposed surfaces shall be free of fabrication marks.

2.05 FABRICATION

A. Pilasters and Doors: Flush, formed of 3/4" thick solid phenolic panels.
1. Door Dimensions: Unless otherwise indicated, furnish 24" wide in-swinging doors for standard toilet compartments, 36" wide clear opening out-swinging doors when located at the end, and 36" wide clear opening out-swinging doors when located at the side for stalls equipped for use by the physically disabled
2. Anchorage Devices: Provide galvanized steel anchorage devices, complete and threaded rods, washers, and leveling adjustment nuts at pilasters, to permit connection to floor slab. Furnish devices, which are designed to support pilasters from structure without transmitting load to floor fill.
3. Overhead Bracing: Provide anti-grip, decorative, heavy duty, extruded aluminum head rail with clear anodized finish.

B. Panels: Flush, formed of 1/2" thick solid phenolic panels. Height and width as indicated in drawings.

2.06 HARDWARE

A. Hardware: Provide all hardware and fasteners for a complete installation.

B. Door hardware shall be cast Type 304 stainless steel, as follows:
1. Hinges: 16 gauge Cast Stainless Steel Continuous Piano Hinge. Hinge shall be cast of type 304 stainless steel and shall have a Satin finish. Hinge shall be spring type for self-closing action and shall be fully adjustable up to 360 degrees. Only stainless steel components shall be used in the construction of the Hinge. Guide pin shall be 1/8 inch stainless steel. Six one-way head stainless steel machine screws per leaf on both door and pilaster, into threaded brass inserts or thru-bolted; inserts independent laboratory-tested to pull-out of 5,000 lb.
2. Strike and Keeper with Emergency Access: Heavy duty cast stainless steel with a Satin finish. The strike and keeper shall be 2.50” high, with the mounting holes at 1.50” on center, and the wall thickness shall be a minimum of .125”. The strike and keeper shall have an integral rubber bumper door stop. The stock number shall be molded into the back of the strike and keeper for ease in identification. Furnish one per door. Stamped stainless steel is not acceptable.
3. Slide Latch: Heavy Duty Cast Stainless steel with a Satin finish. The slide latch shall be surface mounted. The slide bar shall be .150” thick, 1.020” wide and 3.720” long. Latch shall have an internal stainless steel buffering spring to prevent damage when door is inadvertently slammed against the latch. Mounting holes are to be spaced at 3.50” on center. Latch knob is to be riveted to the slide bar and then welded to insure that the knob will not come off. The stock number shall be molded into the back of the slide latch for ease identification. Furnish one per door. Stamped stainless steel is not acceptable.
4. Coat Hook: Heavy Duty Cast Stainless Steel with a Satin finish. Coat Hook and bumper shall be 2.340” high, 1.230” wide and shall protrudes out from the door 3.05”. The hook portion shall have a finished diameter of .250” thick. The stock number shall be molded

into the back of the Coat Hook and Bumper for ease in identification. Furnish one per door. Stamped stainless steel is not acceptable. Mount at 48 inches maximum above finished floor in accessible toilet compartments.

5. Door Stop: Heavy Duty Cast Stainless Steel with a satin finish. Plated Zarnac Door stops are unacceptable. Door Stop shall have a 2.125” base diameter and shall protrude 1.80” from the Wall. The bumper at the end of the Door Stop shall be .250” thick. The diameter of the shaft shall be .6875”. The stock number shall be molded into the back of the Door Stop for ease in identification. Furnish one for each Disabled Accessible door. Stamped stainless steel is not acceptable.
6. Pull Handle: Heavy Duty Cast Stainless Steel with a Satin finish. Plated Zamac Door pulls are unacceptable. Pull Handle shall protrude from the face of the door .940” and shall be 4.735” long. The Pull Handle shall have mounting holes drilled and tapped for 10/24 threads at 3.50” on center. The Pull Handle shall be .655” wide and shall be mounted back to back with the Slide Latch. The stock number shall be molded into the back of the Pull Handle for ease in identification. Stamped stainless steel is not acceptable. Provide u-pull shape shape handle on each side of accessible toilet compartment doors.

C. Pilaster Shoes: ASTM A 1678, Type 302/304 Stainless Steel, minimum 3” high, 15 gauge, finish with #3 Directional polish, attached with Stainless Steel Through Bolts.

D. Continuous Brackets: Full height extruded 6063-T5 Aluminum with a satin anodized finish. The minimum weight shall be 1.685 pounds per lineal foot. Inside opening of Bracket shall be .50” for panels, .75” for pilasters. All holes for mounting to wall and panel/pilaster shall be pre-drilled. Holes are to be spaced at 9” on center along the full length of the Bracket for a total of twelve holes for mounting to the wall and seven holes for mounting to the panel/pilaster. Each Bracket is to have a minimum wall thickness of .125”.

E. Overhead Bracing (Headrail): Continuous heavy duty extruded 6063-T5 Aluminum Headrail with anti-grip profile. Head rail shall have integral reinforcing channel and curtain track. Head rail shall have Satin Anodized finish. Provide Head rail corner brackets, wall brackets, and herd rail end caps as required. The head rail and head rail brackets shall have a minimum wall height of 2”. The head rail and head rail brackets shall have a minimum wall height of 2”. The minimum wall thickness of the head rail and head rail brackets shall be .125”.

F. Chrome-plated, non-ferrous cast alloy material shall not be furnished for hinges, brackets, locks, latches and other fittings and accessories.

G. Fasteners:
1. Tamper-Proof: Zamac or equal stainless steel mushroom-shaped drive-in anchors, non-removable fasteners for anchors, and special tool for removal.
2. Floor and wall fasteners: No. 14 by 1-3/4 inch tamper-proof screws with conical plastic anchors.
3. All other fasteners: 5/8 inch Zamac or equal stainless steel tamper-proof screws or chrome plated brass tamper-proof brass thru-bolts.

PART 3 EXECUTION

3.01 EXAMINATION

A. Before covering wall framing with finish materials, examine framing to ensure that backing plates and structural framing have been installed in such position as to receive all attachment screws.

B. Verify spacing of plumbing fixtures to ensure compatibility with installation of compartments.

C. Do not start the Work of this section until all deficiencies have been corrected.

3.02 INSTALLATION

A. Install panels and pilasters rigid, straight, plumb and level in accordance with manufacturer's instructions.

B. No evidence of drilling, cutting or patching shall be visible in finished Work.

C. Set units with not more than 1/2 inch between pilasters and panels and not more than 3/4 inch between panels and walls.

D. Overhead-Braced: Secure to structural concrete floor and concrete masonry walls.

E. Floor-Mounted: Secure to structural concrete floor.

F. Fasten panels and pilasters to brackets with through bolts and nuts.

G. Fasten urinal screen panels to walls with 2 panel brackets, minimum.

H. Provide for adjustment of floor variations with non-breakable plastic shoes on pilasters. Conceal floor fastenings in pilaster shoes.

I. Furnish each toilet compartment door with top and bottom hinges, and door latch.

J. Install door strike keeper on each pilaster in alignment with door latch.

K. Furnish each toilet compartment door with one coat hook and bumper.

3.03 INSTALLED TOLERANCES

A. Maximum Variation from Plumb or Level: 1/8 inch.

B. Maximum Displacement from Intended Position: 1/8 inch.

3.04 CLEANING AND ADJUSTMENT

A. Adjust doors to align with pilasters and overhead brace, operate freely without excessive force and stop 30 degrees from closed position when unlatched. Out-swinging handicapped partition doors shall return to closed position.

B. Adjust and align door hardware to uniform clearance at vertical edges of doors. Clearance space shall not exceed 1/4 inch.

C. Clean partitions and hardware using methods approved by panel manufacturer.

D. Coordinate installation of toilet accessories section.

E. Tighten anchors to ensure rigid installation.

F. Remove protective plastic coating.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 10 2810
TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Toilet Room Accessories.

B. Underlavatory Guards.

C. Utility Room Accessories.

1.02 RELATED SECTIONS

A. Section 061000 - Rough Carpentry.

B. Section 09 2116 - Gypsum Board Assemblies.

C. Section 09 3000 - Tiling.

D. Section 11 2810 - Detention Toilet Accessories.

1.03 REFERENCES

A. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board; 2004.

B. ASTM A 240/A 240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2006.

C. ASTM A 554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2003.

D. ASTM C 1036 - Standard Specification for Flat Glass; 2001.

E. ASTM F 446 - Standard Consumer Safety Specification for Grab Bars and Accessories Installed in the Bathing Area; 1985 (Reapproved 2004).

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's product data for products specified, indicating selected options and accessories.

C. Shop Drawings:
   1. Plans: Locate each specified unit in project.
   2. Elevations: Indicate mounting height of each specified unit in project.
   3. Details: Indicate anchoring and fastening details, required locations and types of anchors and reinforcement, and materials required for correct installation of specified products not supplied by manufacturer of products of this section.

D. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.

E. Verification Samples: Two sample chips of each specified color and finish.

F. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated in the Toilet and Bath Accessory Schedule and room designations indicated on the Drawings in product schedule.

G. Quality Assurance Submittals:
   1. Manufacturer's printed installation instructions for each specified product.
   2. Documentation of manufacturer's qualifications, specified in QUALITY ASSURANCE Article of this section.

H. Maintenance Data: For accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and service recommendations.

I. Closeout Submittals: Warranty documents, issued and executed by manufacturer of products of this section, and countersigned by Contractor.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five (5) years of documented experience producing products of the types specified in this section.

B. Regulatory Requirements: Conform to ADAAG requirements.

C. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Gardner Spencer Smith Tench and Jarbeau, PC.

D. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specific products indicated in the Toilet and Bath Accessory Schedule.
   1. Other manufacturers' products with equal characteristics may be considered. See Division 01 Section " Substitutions."
   2. Do not modify aesthetic effects, as judged solely by Gardner Spencer Smith Tench and Jarbeau, PC, except with Gardner Spencer Smith Tench and Jarbeau, PC's written approval. Where modifications are proposed, submit comprehensive explanatory data to Gardner Spencer Smith Tench and Jarbeau, PCfor review.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Factory-apply strippable protective vinyl coating to sight-exposed surfaces after finishing of products; ship products in manufacturer's standard protective packaging.

B. Storage and Protection: Store products in manufacturer's protective packaging until installation.

1.07 SEQUENCING

A. Supply locating and sizing templates, and other requirements, to fabricators and installers of products referenced in RELATED SECTIONS Article for building in products of this section.

B. Supply reinforcing and anchoring devices required for installation of products of this section to fabricators and installers of products referenced in RELATED SECTIONS Article.

1.08 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer's standard warranty against defects in product workmanship and materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable manufacturers; subject to compliance with specified design criteria, provide accessories fabricated by single manufacturer.

B. Basis-of-Design Product: The design is based on each toilet accessory specified. Subject to compliance with requirements, provide either named product or a comparable product by one of the manufacturers specified.
   1. Toilet and Bath Accessories:
      a. Basis of design: ASI-American Specialties, Inc; www.americanspecialties.com.
      b. A&J Washroom Accessories; ajwashroom.com.
      c. Bobrick Washroom Equipment, Inc; www.bobrick.com.
      d. Bradley/Washfountain Co; www.bradleycorp.com.
      e. McKinney/Parker, Div./Essex Industries.
      f. Substitutions: Division 01 - Product Requirements.
         1) Supply all products of this section from a single manufacturer.
   2. Underlavatory Guards:

a. Basis of design: Brocar Products, Inc.
b. Other acceptable manufacturers: Truebro Inc. and Plumberex Specialty Products Inc.
c. Substitutions: Division 01 - Product Requirements.

2.02 MATERIALS

A. Stainless Steel Sheet: ASTM A 240/A 240M, Type 304, 18-8 alloy.

B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; ASTM B 30, castings.

C. Stainless Steel Tubing: ASTM A 269, Type 304 or 316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M, with G90/Z275 coating.

E. Mirror Glass: Float glass, ASTM C 1036 Type I, Class 1, Quality Q2, with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with GSA CID A-A-3002.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FABRICATION

A. Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories: Unless otherwise indicated fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

C. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide concealed anchorage that fully concealed when unit is closed.

D. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation and prevents moisture accumulation.
1. Provide galvanized steel backing sheet, not less than 0.034-inch (0.85-mm) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not acceptable filler material.

E. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper and theft-resistant installation, as follows:
1. One-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
2. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

F. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Union County Commissioner's Office's representative.

2.04 UTILITY ROOM ACCESSORIES

A. Basic Construction Requirements:
1. Doors: Fabricated from minimum 0.0313 inch stainless steel sheet, formed hems at sight-exposed edges; welded corners, finished to match sheet finish.
2. Cabinets: Fabricated from minimum 0.0313 inch stainless steel sheet, formed hems at sight-exposed edges; all joints welded, sight-exposed welds finished to match sheet finish.

3. Hinges: Stainless steel piano hinge, 3/16 inch diameter barrel, full length of cabinet; hinge leaves spot-welded to door and cabinet body.
4. Locks: Tumbler locks, keyed alike other toilet accessory locks, with two keys for each lock.
5. Stainless Steel Finish: No.4 satin.

B. Paper Towel Dispenser and Waste Receptable (T08): Model 0469-BL (recessed).

C. Toilet Seat Cover Dispenser (T03): Model 20477-SM (surface mounted).

D. Toilet Paper Dispenser (T04) [<>]: By Owner.

E. Soap Dispenser (T05): By Owner.

F. Mop Holder (T09)<>: Model 0796-3.

G. Underlavatory Guard (Typical): Insulated pipe covering, white antimicrobial, molded-vinyl covered for supply and drain piping assemblies intended for use at accessible lavatories to prevent direct contact with burns from piping. Provide components as required for applications indicated with flip tops at valves that allow service access without removing coverings. Model #101 E-Z by Truebro, Inc or as specified in Plumbing Section.

2.05 MIRRORS

A. Mirror (T06 & T07): Model 0600.
1. Frame: Angle.
2. Mirror: Tempered glass.
3. Size: As indicated on drawings.
4. Finish: No.4 satin stainless steel.

B. Angle Mirror Frames: Fabricated from 0.050 inch stainless steel, formed to 3/4 by 5/8 inch angle; heliarc-welded corners, finished to match sheet finish; concealed "H" type mounting bracket with tamper-proof fasteners.

C. Channel Mirror Frames: Fabricated from 0.0375 inch stainless steel, formed to 1/2 by 1/2 by 1/2 inch channel; finished to match sheet finish; concealed mounting brackets with tamper-proof fasteners.

D. Tempered Glass Mirror: 1/4 inch thick polished tempered glass, two coats silver, hermetically sealed with uniform electrolytically-deposited copper plating, backpainted with waterproof coating.

2.06 GRAB BARS

A. Grab Bars - Basic Requirements: Fabricated to comply with ASTM F 446 and to withstand a 900 pound force, from ASTM A 554 stainless steel tubing, 0.050 inch, Type 304, 18-8 alloy; formed 1-1/2 inch radius return to wall at each end; each end heliarc-welded to minimum 11 gage stainless steel circular flange; welds finished to match tube finish.

B. Grab Bars (T01-T02): Series 3800.
1. Peened finish.
2. Sizes and configurations: As indicated on drawings.
3. Tubing size for adults: 1-1/2".

C. Grab Bar Snap-on Mounting Flanges: Snap-on stainless steel cover, 0.0313 inch, 3 inch diameter by 1/2 inch deep, for concealing grab bar mounting flange.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
1. Prepared openings are sized and located in accordance with shop drawings.
2. Reinforcement and anchoring devices are correct type and are located in accordance with shop drawings.

B. Installer's Examination:
   1. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
   2. Transmit two copies of installer's report to Gardner Spencer Smith Tench and Jarbeau, PC within 24 hours of receipt.
   3. Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.
   4. Beginning construction activities of this section indicates installer's acceptance of conditions.

3.02 INSTALLATION

A. Install toilet accessories plumb and level in accordance with shop drawings and manufacturer's printed installation instructions.

B. Locate toilet accessories at heights specified by Americans with Disabilities Act (ADA).

C. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws.

D. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.03 CLEANING

A. Remove manufacturer's protective vinyl coating from sight-exposed surfaces 24 hours before final inspection.

B. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

C. Clean surfaces in accordance with manufacturer's recommendations.

3.04 PROTECTION OF INSTALLED PRODUCTS

A. Protect products from damage caused by subsequent construction activities.

B. Field repair of damaged product finishes is prohibited; replace products having damaged finishes caused by subsequent construction activities.

END OF SECTION

SECTION 31 3116
TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chemical soil treatment.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete: Vapor barrier placement under concrete slab-on-grade.

B. Section 07 2500 - Vapor Retarders.

1.03 REFERENCE STANDARDS

A. Title 7, United States Code, 136 through 136y - Federal Insecticide, Fungicide and Rodenticide Act 2006.

B. Agriculture Department of the State of Georgia: "Rules of the Georgia Structural Pest Control Commission", current edition.

1.04 SUBMITTALS

A. See Division 01 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.

C. Container Label: Submit copy of container label.

D. Test Reports: Indicate regulatory agency approval reports when required.

E. Manufacturer's Instructions: Indicate caution requirement.

F. Manufacturer's Certificate: Certify that toxicants meet or exceed specified requirements.

G. Record and document moisture content of soil before application.

H. Warranty: Submit warranty and ensure that forms have been completed in Union County Commissioner's Office's name.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing this type of work and:
   1. Having minimum of three (3) years documented experience.
   2. Approved by manufacturer of treatment materials.
   3. Certified by the State of Georgia in accordance with the requirements of the Department of Agriculture.
   4. Licensed in Georgia.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for requirements for application, and comply with EPA regulations.

B. Use only termiticides which bear a Federal registration number of the United States Environmental Protection Agency.

1.07 SEQUENCING

A. Give Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office 48 hours notice prior to time that application of soil treatment is to commence.

B. Apply toxicant immediately prior to installation of vapor barrier under slabs-on-grade or as recommended by the certified installer.

C. Do not schedule application if rain is forecasted during or after application.

D. Make application at end of work day.

1.08 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

B. Provide five year installer's warranty against damage to building caused by termites.

C. Warrant effectiveness of treatment for period of Five (5) years, non-prorated from date of Substantial Completion against infestation and/or termite damage. without additional cost to the Owner during warranty period. Warranty shall be in the form of an insurance policy, written in the amount of 10% of the construction cost or One Hundred Thousand and NO/100 Dollars ($100,000.00), whichever is less, for damages to building and contents. Rating for insurance company shall be A-, IV (4). The warranty shall be submitted along with other documents in accordance with Contract Close-Out section.

D. Warranty shall state dates of application and chemicals used, including quantities and concentrations.

E. Warranty shall be renewable on a year-to-year basis at the end of a five year period, at Union County Commissioner's Office's option, for a fee to be mutually agreed upon at the time of renewal.

F. Contractor shall re-treat soil and repair or replace damage caused by termite infestation at no additional charge to Union County Commissioner's Office

PART 2 PRODUCTS

2.01 CHEMICAL SOIL TREATMENT

A. Toxicant Chemical: EPA Title 7, United States Code, 136 through 136y approved; synthetically color dyed to permit visual identification of treated soil.

B. Diluent: Recommended by toxicant manufacturer.

C. Manufacturers:
   1. Bayer Environmental Science Corp: www.backedbybayer.com/pest-management.
   2. Control Solutions Inc: www.controlsolutionsinc.com.
   3. FMC Professional Solutions: www.fmcprosolutions.com.
   4. Syngenta Professional Products: www.syngentaprofessionalproducts.com.
   5. Substitutions: See Division 01 - Product Requirements.

D. Mixes: Mix toxicant to manufacturer's instructions.

E. Toxicant Chemical: EPA ({\rs\#1}) approved; synthetically color dyed to permit visual identification of treated soil.

F. Diluent: Recommended by toxicant manufacturer.

2.02 MIXES

A. Mix toxicant to manufacturer's instructions.

B. Mixtures of chemicals are prohibited, except as pre-mixed from manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

B. Verify final grading is complete.

C. Remove foreign matter which could decrease effectiveness of treatment in areas too be treated.

3.02 APPLICATION - CHEMICAL TREATMENT

A. Comply with requirements of U.S. EPA and applicable state and local codes.

B. Spray apply toxicant in accordance with manufacturer's instructions.

C. Apply toxicant at following locations:
   1. Under Slabs-on-Grade.
   2. At Both Sides of Foundation Surface.
   3. Around plumbing pipes, electrical conduit, interior column footings, and slab penetrations.
   4. Outside edge of building. Treat soil at outside edge of building. Dig a trench 8" wide along the outside of foundation to a depth of 1'-0" minimum. Punch holes to the top of footing at 1'-0" o.c. and apply treatment. Mix soil treatment with soil as it is replaced in trench.

D. Under slabs, apply toxicant 12 hours prior to installation of vapor barrier.

E. At foundation walls, apply toxicant 12 hours prior to finish grading work outside foundations.

F. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.

G. Re-treat disturbed treated soil with same toxicant as original treatment.

H. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

I. Perform no treatment when soil is wet or after rains. Avoid flow of toxicant from treated surfaces.

3.03 INSTALLATION - SITE-APPLIED TERMITICIDE

A. Comply with manufacturer's written instructions.

3.04 PROTECTION

A. Do not permit soil grading over treated work.

B. Protect sheet materials from damage after completed installation. Repair damage with manufacturer's recommended products and according to the manufacturer's written instructions.

C. Post signs in areas of applications, warning that poison has been applied; leave signs in place for minimum 2 weeks following application.

END OF SECTION