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END OF SECTION

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: County Services 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

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 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 Applications for Payment.

B. Division 01 for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule and construction photographs.

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

D. 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.

C. Post-consumer Recycled Content: The percentage of waste material by weight from industrial use incorporated into a building material.

D. Post-industrial Recycled Content: The percentage of waste material by weight from industrial use incorporated into a building material.

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 five 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.

a. Submit one correctable, translucent, reproducible print and blue- or black-line prints. Gardner Spencer Smith Tench and Jarbeau, PC will return the reproducible print.

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. Printed performance curves.
      h. Operational range diagrams.
      i. Mill reports.
      j. Standard product operating and maintenance manuals.
      k. Compliance with recognized trade association standards.
      l. Compliance with recognized testing agency standards.
      m. Application of testing agency labels and seals.
      n. Notation of coordination requirements.
   4. Includes the following information for all products:
      a. Location where product was manufactured.
      b. Location where product was harvested or extracted.
      c. Percent Post-industrial recycled content.
      d. Percent Post-consumer recycled content.

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.

F. Delegated-Design Submittal: Comply with requirements in Division 01.

G. Submittal Schedule: Comply with requirements in Division 01.

H. Application for Payment: Comply with requirements in Division 01.

I. Schedule of Values: Comply with requirements in Division 01.

J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tubular form:
    1. Name, address, and telephone number of entity performing subcontract or supplying products.
    2. Number and title of related Specification Section(s) covered by subcontract.

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

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

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

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

I. 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.

J. 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.

K. Compatibility Test Reports: Prepare reports written by a 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.

L. 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.

M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturer's names.
5. Description of product.
6. Test procedures and results.

7. Limitations of use.

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

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

Q. 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.

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

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

T. Construction Photographs: Comply with requirements in Division 01.

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, as follows:

1. Final Unrestricted Release: When the Gardner Spencer Smith Tench and Jarbeau, PC marks a submittal “Approved,” the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. Final-But-Restricted Release: When Gardner Spencer Smith Tench and Jarbeau, PC marks a submittal “Approved as Noted,” the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
3. Returned for Resubmittal: When Gardner Spencer Smith Tench and Jarbeau, PC marks a submittal “Rejected/Resubmit,” do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
    a. Do not use, or allow others to use, submittals marked “Rejected/Resubmit” at the Project Site or elsewhere where work is in progress.
4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, Gardner Spencer Smith Tench and Jarbeau, PC will return the submittal without action.

C. Informational Submittals: Gardner Spencer Smith Tench and Jarbeau, PC will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Gardner Spencer Smith Tench and Jarbeau, PC will forward each submittal to appropriate party.

D. Unsolicited Submittals: Gardner Spencer Smith Tench and Jarbeau, PC will return or discard unsolicited submittals to the sender without action.

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. 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. Reviewed shop drawings, product data, and samples.
   4. Manufacturer's instruction for assembly, installation, and adjusting.

B. 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.
    a. Note changes made by modifications to the contract; include identification numbers if applicable.
8. New information which may be useful to the Owner, but which was not shown in either the contract documents or submittals.

C. 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.

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

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

F. 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 SECTION INCLUDES

A. Final Cleaning.

1.02 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.

1.03 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.

1.04 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.

1.05 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. Incidental work.

1.02 RELATED SECTIONS

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

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 03 2000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 01 4110.

B. Section 03 1000 - Concrete Forming and Accessories.

C. Section 03 3000.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete 2016.

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

C. ACI SP-66 - ACI Detailing Manual 2004.

D. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

E. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement 2019.

F. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

G. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

H. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2020.

I. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.

J. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement 2019, with Editorial Revision.

K. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel 2018.

L. CRSI (DA4) - Manual of Standard Practice 2009.

M. CRSI (P1) - Placing Reinforcing Bars 2011.

1.04 SUBMITTALS

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

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

C. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
   1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in Georgia.

D. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

E. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

F. Closeout Submittals: Record exact locations of reinforcing that vary from Shop Drawings.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.

B. Provide Gardner Spencer Smith Tench and Jarbeau, PC with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.

C. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

D. Source Quality Control: Refer to Division 01 Sections for general requirements and to following paragraphs for specific procedures. Testing laboratory retained by Union County Commissioner's Office shall perform following conformance testing, select test Samples of bars, ties, and stirrups from the material at the Project site or from the place of distribution, with each Sample consisting of not less than two 18 inch long pieces, and perform the following tests according to ASTM A 615.
   1. Identified Bars: If Samples are obtained from bundles as delivered from the mill, identified as to heat number, accompanied by mill analyses and mill test reports, and properly tagged with the identification certificate so as to be readily identified, perform one tensile and one bend test for each 10 tons or fraction thereof of each size of bars. Submit mill reports when Samples are selected.
   2. Unidentified Bars: When positive identification of reinforcing bars cannot be performed and when random Samples are obtained, perform tests for each 2.5 tons or fraction thereof, one tensile and one bend test from each size of bars.

1.06 DELIVERY, STORAGE AND HANDLING

A. Avoid exposure to dirt, moisture or conditions harmful to reinforcing.

B. Reinforcing steel bars, wire, and wire fabric shall be stored on the Project site to permit easy access for examination and identification of each shipment. Material of each shipment shall be separated for size and shape.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Provide reinforcing of sizes, gages and lengths indicated, bent to indicated shapes.

B. Steel Reinforcing Bars: ASTM A 615, or ASTM A 706 deformed grade 60 billet steel unless otherwise specified or indicated.

C. Bars or Rod Mats: ASTM A 184.

D. Wire Fabric for Reinforcement: ASTM A 185.

E. Reinforcement Accessories:
   1. Tie Wire: ASTM A 82, fully annealed, copper-bearing steel wire, 16 gage minimum.
   2. Chairs, Spacers, Supports, and Other Accessories: Standard manufacture conforming to ACI-315 fabricated from steel wire of required types and sizes. For reinforcement supported from grade, provide properly sized dense precast blocks of concrete.

2.02 FABRICATION

A. Comply with CRSI Manual of Standard Practice for Reinforced Concrete Construction for fabrication of reinforcing steel.

B. Bending and Forming: Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bend bars No. 6 size and larger in the shop only. Bars with unscheduled kinks or bends are not permitted. Provide only tested and permitted bar materials.

C. Welding: Provide only ASTM A 706 steel where welding is indicated. Perform welding by the direct electric arc process in accordance with AWS D1.4 and specified low-hydrogen electrodes. Preheat 6 inches each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is not permitted. Do not tack weld bars. Clean metal surfaces to

be welded of loose scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal. Cut out welds or parts of welds deemed defective, using chisel, and replace with proper welding.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Do not displace or damage vapor barrier.

C. Accommodate placement of formed openings.

D. Bars shall be bent cold. Bars partially embedded in concrete shall not be field bent except as indicated on reviewed Shop Drawings. Before installation, clean reinforcing of loose scale, rust, oil, dirt and any coating that could reduce bond.

E. Accurately position, install, and secure reinforcing to prevent displacement during the placement of concrete.

F. Provide metal chairs to hold reinforcement the required distance above form bottoms. In beams and slab construction, provide chairs under top slab reinforcement as well as under bottom reinforcement. Space chairs so that reinforcement will not be displaced during installation. Provide metal spacers to secure proper spacing. Stirrups shall be accurately and securely wired to bars at both top and bottom. At slabs, footings, and beams in contact with earth, provide concrete blocks to support reinforcement at required distance above grade.

G. Install and secure reinforcement to maintain required clearance between parallel bars and between bars and forms. Lapped splices shall be installed wherever possible in a manner to provide required clearance between sets of bars. Stagger lapped splices. Dowels and bars extending through construction joints shall be secured in position against displacement before concrete is installed and subsequently cleaned of concrete encrustation’s while they are still soft.

H. Do not install reinforcing in supported slabs and beams until walls and columns have been installed to underside of slabs and beams or until construction joints have been thoroughly cleaned. Reinforcing shall be inspected before placement of concrete and cleaned as required.

I. Use deformed bars unless otherwise indicated, except for spiral reinforcement.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Division 01, will inspect installed reinforcement for conformance to contract documents before concrete placement.

3.03 CLEAN UP

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

3.04 PROTECTION

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

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floors and slabs on grade.

1.02 RELATED REQUIREMENTS

A. Division 01 - Testing and Inspection.

B. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.

C. Section 03 2000 - Concrete Reinforcing.

D. Section 03 3513 - Concrete Finishing.

E. Section 07 2500 - Vapor Retarders: Below slab vapor retarders.

F. Section 07 9005: Sealants for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).

B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete 1998 (Reapproved 2004).

C. ACI 301 - Specifications for Structural Concrete 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).

F. ACI 305R - Guide to Hot Weather Concreting 2010.

G. ACI 306R - Guide to Cold Weather Concreting 2016.

H. ACI 308R - Guide to External Curing of Concrete 2016.

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

J. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

K. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

L. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2020.

M. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement 2019.

N. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars 2019.

O. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement 2019, with Editorial Revision (2020).

P. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.

Q. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.

R. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2021a.

S. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.

T. ASTM C150/C150M - Standard Specification for Portland Cement 2020.

U. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete 2016.

V. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method 2016.

W. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).

X. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019.

Y. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2019.

Z. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing 2017.

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

BB. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2021.

CC. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type) 2011 (Reapproved 2016).

DD. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.

EE. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars 2021.

FF. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers 2020.

GG. ASTM E 1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers [Metric]; 1996 (Reapproved 2008).

HH. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.

II. COE CRD-C 48 - Method of Test for Water Permeability of Concrete 1992.

JJ. COE CRD-C 513 - COE Specifications for Rubber Waterstops 1974.

KK. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop 1974.

1.04 SUBMITTALS

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

B. Shop Drawings: Submit Shop Drawings indicating locations of cast-in-place concrete Work and accessory items such as vapor barriers. Include details and locations of reinforcing, embedded items, and interfacing with other Work.

C. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

D. Material Samples: Submit Samples illustrating concrete finishes, minimum 12 inches x 12 inches in size.

E. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

F. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

G. Certificates: Submit a notarized certificate that each of following conforms to standards indicated:
   1. Aggregates – ASTM Standards C33.
   2. Admixtures - ASTM Standards C260.

3. Curing materials - ASTM Standards C171.

1.05 RECORD DOCUMENTS

A. Ready-mixed concrete shall be used for all cast-in-place concrete. Ready-mixed concrete suppliers shall each qualify under the requirements of ASTM Specification C 94-06a entitled "Ready-Mixed Concrete". Ready-mixed concrete shall be mixed and transported as required by the same ASTM Specification, and delivery tickets shall be dated the time of leaving the plant and the time the truck is completely unloaded..

B. Submit shop drawings in accordance with the requirements of the Submittals Section. Show size, type, and location of all reinforcing bars, bar supports, and forms. Drawings must bear the approval of the General contractor. Drawings will not be reviewed without this approval.

C. Submit mix designs for review.

1.06 QUALITY ASSURANCE

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

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

D. Continuous inspection shall be provided at the batch plant and for transit-mixed concrete to run check sieve analysis of aggregate, check moisture content of fine aggregate, check design of mix, check cement being used with test reports, check loading of mixer trucks, and certify to quantities of materials placed in each mixer truck.

E. Inspection shall be performed by a representative of a testing laboratory selected by Union County Commissioner's Office. Union County Commissioner's Office will pay for inspection costs. Notify the laboratory 24 hours in advance of time concrete is to be mixed. Notify the laboratory of postponement or cancellation of mixing within at least 24 hours of scheduling time.

F. Continuous batch plant inspection requirement may be waived. Waiver shall be in writing, including Union County Commissioner's Office approval.

G. Strength Test of Concrete: Refer to Division 01: Testing and Inspection.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

1.08 DELIVERY, STORAGE AND HANDLING

A. Mixing and Placing Concrete: Refer to Division 01: Testing and Inspection.

B. Ready-mix concrete shall be mixed and delivered in accordance with ASTM C 94 . Each batch of concrete delivered to the Project site shall be accompanied by a time slip bearing departure time and signature of batch plant supervisor. Concrete shall be placed within 90 minutes after start of mixing.

C. Store cement and aggregate materials so as to prevent their deterioration or intrusion by foreign matter. Deteriorated or contaminated materials shall not be furnished.

1.09 JOB CONDITIONS

A. Cold Weather Requirements:
   1. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather. Surfaces, in which concrete is to come in contact with, shall be free from frost or ice. No frozen materials or materials containing ice shall be furnished.
   2. When placing concrete during freezing or near-freezing weather the mix shall have a temperature of at least 50 degrees F., but not more than 90 degrees F. when cement is added. Concrete shall be maintained at a temperature of at least 50 degrees F. for at least 72 hours after placing or until it has thoroughly hydrated. When necessary, concrete materials shall be heated before mixing. Special precautions shall be provided for

protection of transit-mixed concrete.

B. Hot Weather Requirements: During hot weather, proper attention shall be provided for ingredients, production methods, handling, placing, protection and curing, to prevent excessive concrete temperatures or water evaporation which could impair required strength or durability.

PART 2 PRODUCTS

2.01 GENERAL

A. Ready-Mixed Concrete: Mix and deliver in accordance with requirements of ASTM C94.

B. Strength of Concrete: Concrete, unless otherwise indicated or specified, shall be provided with a minimum ultimate 28-day strength of 3000 psi (f'c). For high-early-strength concrete, age for reaching the f'c shall be as indicated on Drawings.

2.02 FORMWORK

A. Comply with requirements of Section 03 1000.

2.03 REINFORCEMENT

A. Comply with requirements of Section 03 2000.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C 150. Furnished cement shall be as selected and reviewed for concrete proportioning.

B. Aggregates: Aggregates shall conform to ASTM C 33 and C 227 except as modified herein. Any suitable individual grading of coarse aggregate may be furnished, provided Grading of Combined Aggregate indicated in following table is obtained. Refer to Section 01420: Testing and Inspection.

2.05 GRADING OF COMBINED AGGREGATE

A. Sieve Number or1-1/2"1"3/4"

B. Size in Inches MaximumMaximumMaximum

C. Passing a 2"----------

D. Passing a 1-1/2"95-100----------

E. Passing a 1"70-9090-100------

F. Passing a 3/4"50-8070-9590-100

G. Passing a 3/8"40-6045-7055-75

H. Passing a No. 435-5535-5540-60

I. Passing a No. 825-4027-4530-46

J. Passing a No. 1616-3420-3823-40

K. Passing a No. 3012-2512-2713-28

L. Passing a No. 502-125-155-15

M. Passing a No. 1000-30-50-5

N. Water: Water shall be potable and free from deleterious matter.

O. Admixtures: ASTM C 494.

P. Expansion Joint Fillers: Preformed strips, non-extruding and resilient bituminous type, of thickness indicated, conforming to ASTM D 1751.

Q. Curing Paper and Liquid Curing Compounds: See Section 03350- Concrete Finishing.

R. Abrasive Aggregate: See Section 03 3513 - Concrete Finishing.

S. Underlayment: Latex underlayment for filling low spots in concrete shall be Tile-Tex by Flintkote Co., Webtex #60 or Fixallatex by Dowman Products Co.

T. Vapor Retarder: See Section 07 2500 - Vapor Retarders.

2.06 CONCRETE MIX DESIGN

A. All Concrete
   1. 28-Day Strength: 3000 psi
   2. Type: Normal Weight
   3. Slump Range: 4" + 1"
   4. Weight: 135 pcf - 150pcf
   5. Air Entrained: 5% + 1% (For Exterior Concrete Only)

B. Accessories: Accessories used in exposed concrete shall be galvanized. Footing and slab-on-ground reinforcements shall be supported on solid blocks of concrete, concrete brick, or similar concrete masonry.

PART 3 EXECUTION

3.01 GENERAL

A. Time of Placing: Do not place concrete until reinforcement, conduits, outlet boxes, anchors, hangers, sleeves, bolts, and other embedded materials are securely fastened in place. Contact the Union County Commissioner's Office's OR at least 24 hours before placing concrete; do not place concrete until inspected by the Union County Commissioner's Office's OR.

B. Pouring Record: A record shall be kept on the Project site of time and date of placing concrete in each portion of structure. Such record shall be maintained on the Project site until Substantial Completion and shall be available for examination by Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office's OR.

3.02 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.03 PREPARATION

A. Vapor Retarder: See Section 07 2500 - Vapor Retarders for instructions.

B. Reglets and Rebates:
   1. Form reglets and rebates in concrete to receive flashing, frames and other equipment as detailed and required. Coordinate dimensions and locations required with other related Work.
   2. If concrete slabs on grade adjoin a wall or other perpendicular concrete surface, form a reglet in wall to receive and carry horizontal concrete Work. Reglet shall be full thickness of the slab and shall be 3/4 inch wide, unless otherwise indicated. Requirement does not apply to exterior walks, unless specifically indicated.

C. Anchor Slots: Dove-tail anchor slots at concrete walls to receive masonry veneer shall be set vertically in forms, 24 inches maximum on centers measured horizontally. Anchor slots shall be No. 24 gage galvanized sheet steel with removable fiber filler to prevent seepage of cement in slot.

D. Screeds: Install screeds accurately and maintain at required grade or slab elevations after steel reinforcement has been installed , but before starting to place concrete. Install screeds adjacent to walls and in parallel rows not to exceed 8 feet on centers.

E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Conveying and Placing:

1. Concrete shall be placed only under direct observation of the Union County Commissioner's Office's OR. Do not place concrete outside of regular working hours, unless the Union County Commissioner's Office's OR has been notified at least 48 hours in advance.
2. Concrete shall be conveyed from mixer to location of final placement by methods, which will prevent separation or loss of materials.
3. Concrete shall be placed as nearly as practicable to its final position to avoid segregation due to re-handling or flowing. No concrete that has partially hydrated or has been contaminated by foreign materials shall be placed, nor shall re-tempered concrete or concrete which has been remixed after initial set be placed.
4. In placing concrete in columns, walls or thin sections, provide openings in forms, elephant trunks, tremies or other recognized devices, to prevent segregation and accumulation of partially hydrated concrete on forms or metal reinforcement above level of concrete being placed. Such devices shall be installed so that concrete will be dropped vertically. Unconfined vertical drop of concrete from end of such devices to final placement surface shall not exceed 6 feet.
5. Concrete shall be placed as a continuous operation until placing of panel or section is completed. Top surfaces of vertically formed lifts shall be level.
6. Concrete shall be thoroughly consolidated during placement, and shall be worked around reinforcement and embedded fixtures with mechanical vibrators.
    a. Vibrators of the internal type shall be used to mechanically vibrate concrete while being placed. Particular attention shall be given the vibrating concrete to insure a dense, homogeneous mass free of air bubbles and honeycombs; however, care shall be taken not to separate materials by excessive vibrating. Vibrators shall not be used as a transporting facility.
7. Where conditions make consolidation difficult, or where reinforcement is congested, batches of mortar containing same proportions of cement, sand, and water as provided in the concrete, shall first be deposited in the forms to a depth of at least one inch.

D. Compaction and Screeding:
1. Tamp freshly placed concrete with a heavy tamper until at least 3/8 inch of mortar is brought to surface. Concrete shall then be tamped with a light tamper and screeded with a heavy straightedge until depressions and irregularities are eliminated, and surface is true to finish grades or elevations. Remove excess water and debris.
2. Where slabs are to receive separate cement finish or mortar setting bed, continued tamping to raise mortar to surface is not performed. Laitance shall be removed by brushing with a stiff brush or by light sandblasting to expose clean top surface of coarse aggregate.

E. Filling, Leveling and Patching:
1. Concrete slabs exhibiting high or low spots and indicated to receive resilient floor covering or soft floor covering, shall have surfaces repaired. High spots shall be honed, or ground with power-driven machines to required tolerances. Low spots shall be filled with latex underlayment, installed in strict accordance with manufacturer's written recommendations.
2. Holes resulting from form ties or sleeve nuts shall be solidly packed, through exterior walls, by pressure grouting with cement grout, as specified. Grouted holes on exposed surfaces shall be screeded flush and finished to match adjoining surfaces.
3. Areas requiring patching shall not exceed two square feet per 1000 square feet of surface area. Areas having excessive defects, as determined by Gardner Spencer Smith Tench and Jarbeau, PC, shall be removed and replaced.
4. Following the finishing operation, patch voids, honeycombs, form tie holes and defects using a mixture of similar proportions to original concrete, deleting coarse aggregate where necessary.
5. In preparing areas to receive patch, remove loose pieces and chip out adjacent sound concrete to avoid featheredge conditions.

6. Apply coating of bonding agent to areas being patched. Take care to prevent staining of exposed surfaces. Apply bonding agent in accord with manufacturer's product recommendations.
7. Fill in area with selected mix, bringing to same level as original concrete. Brush out area to match surrounding work. Allow to cure.

F. Cement Base: Cement base shall be of the height, thickness, and shape detailed. Base shall be reinforced with one inch mesh, 18 gage, zinc-coated wire fabric. Base finish mixture shall be one part Portland cement, 2 parts of fine aggregate and one part pea gravel. Colored cement base shall include a chemically inert mineral oxide pigment in the mix.

G. Conduit Work: Electrical conduit shall be completely buried in the concrete. Low conduit shall be tied down on top of the bottom reinforcing rods. No conduit shall be spaced closer than 2 1/2 inches on center.

H. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on the drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for conformance to specified tolerances.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
2. Under Portland Cement Terrazzo: F(F) of 50; F(L) of 50, on-grade only.
3. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
4. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
5. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.

C. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 FIELD QUALITY CONTROL

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

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

D. Molded Cylinder Tests:
1. Union County Commissioner's Office Consultant will prepare cylinders. Each cylinder shall be dated, given a number, point in structure from which sample was obtained, mix design number, mix design strength and result of accompanying slump test noted.
2. Separate tests of molded concrete cylinders obtained at same place and time shall be made at age of 3 days, 7 days, and 28 days. A strength test shall be the average of the compressive strength of 2 cylinders, obtained from the same sample of concrete and tested at 28 days or at test age designated for determination of f'c.
3. Test cylinders shall be prepared at the Project site and stored in testing laboratory in accordance with ASTM C 31, and tested in accordance with ASTM C 39.

E. Core Test: At request of Gardner Spencer Smith Tench and Jarbeau, PC, cores of hardened concrete shall be cut from portions of hydrated structures for testing, in accordance with ASTM C 42.
   1. Provide 4 inch diameter cores at representative places throughout the structure as designated by the Architect.
   2. In general, provide sufficient cores to represent concrete placed with at least one core for each 4,000 square feet of building area, and at least 3 cores total for each Project.
   3. Where cores have been removed, fill voids with drypack, and patch the finish to match the adjacent existing surfaces.

F. Concrete Consistency: Measure consistency according to ASTM C 143. Test twice each day or partial day's run of the mixer.

G. Adjustment of Mix: If the strength of any grade of concrete for any portion of Work, as indicated by molded test cylinders, fall below minimum 28 days compressive strength specified or indicated, adjust mix design for remaining portion of construction so that resulting concrete meets minimum strength requirements.

H. Concrete For Equipment Pads, Mechanical and Electrical Work: Unless otherwise indicated, strength shall be 3,000 psi concrete. Exposed concrete shall be provided with a hand trowel finish with radius corners and edges. Form and place concrete where necessary as described in Section 03 1000 - Concrete Forming and Accessories, and reinforced as described in Section 03 2000 - Concrete Reinforcing. Calcium chloride shall not be furnished in any concrete mix provided for the installation of underground electrical conduits. For concrete encasement of more than one conduit, furnish 3/4 inch to 1 inch aggregate as specified for concrete mix.

3.08 DEFECTIVE CONCRETE

A. Should strength of any grade of concrete, for any portion of Work indicated by tests of molded cylinders and core tests, fall below minimum 28 days strength specified or indicated, concrete will be deemed defective Work and shall be replaced or adequately strengthened in a manner acceptable to the Gardner Spencer Smith Tench and Jarbeau, PC and Union County Commissioner's Office's OR.

B. Concrete Work that is not formed as indicated, is not true within 1/250 of span, not true to intended alignment, not plumb or level where so intended, not true to intended grades and levels, contains sawdust shavings, wood or embedded debris, or does not fully conform to Contract provisions, shall be deemed to be defective Work and shall be removed and replaced.

C. Repair or replacement of defective concrete will be determined by the Gardner Spencer Smith Tench and Jarbeau, PC. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Gardner Spencer Smith Tench and Jarbeau, PC for each individual area.

3.09 CLEAN UP

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

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

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

END OF SECTION

SECTION 03 3513
CONCRETE FINISHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finishing slabs on grade, monolithic floor slabs, and separate floor toppings.
   1. Finishes shall be defined in ACI 301. Uses of finishes shall be as defined herein, shown on drawings or as suggested in ACI 301 where not indicated.

B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

1.02 RELATED SECTIONS

A. Section 031000 - Concrete Forms & Accessories.

B. Section 032000 - Concrete Reinforcement.

C. Section 033000 - Cast-in-Place Concrete: Prepared concrete floors ready to receive finish.

D. Section 033000 - Cast-in-Place Concrete: Control and formed expansion and contraction joints and joint devices.

E. Section 079005 - Joint Sealers.

1.03 REFERENCES

A. ACI 117 - Standard Tolerances for Concrete Construction and Materials.

B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.

C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004.

D. ACT 305 - Hot Weather Concreting.

E. ACT 306 - Cold Weather Concreting.

F. ACT 308 - Standard Practice for Curing Concrete.

G. ASTM E 1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2001).

1.04 SUBMITTALS

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

B. Product Data: Provide data on concrete hardener, sealer, slip resistant treatment, and any other manufactured products, including information on compatibility of different products and limitations.

C. Maintenance Data: Provide data on maintenance renewal of applied coatings.

D. Samples: Submit five pounds of aggregate proposed for exposed aggregate finishes, indicate color, texture and size anticipated in finish work conditions.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.07 PROJECT CONDITIONS

A. Coordinate the work with concrete floor placement and concrete floor curing.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury immediately after placement and shall be maintained with minimal moisture loss at relatively constant temperature for the period necessary for hydration of the cement and

hardening of the concrete.

B. Concrete finishes shall be protected against frost and freezing, rapid drying, and heavy rains.

PART 2 PRODUCTS

2.01 COMPOUNDS - HARDENERS AND SEALERS

A. Curing and Sealing Compound:
   1. Type: Clear, acrylic-based, non-yellowing, meeting ASTM C309, Type I.
   2. Acceptable products:
      a. W.R. Meadows Co., SealTight CS-309-25.
      b. Degussa Building Systems, Kure-N-Seal.
      c. Symons, Cure & Seal.
   3. Location: Use Curing and Sealing Compound on concrete floor slabs in areas not scheduled to receive additional finish or where noted on the Finish Schedule.

B. Liquid Curing Compound:
   1. Type: Clear, water-based, non-yellowing, meeting ASTM C309, Type I.
   2. Acceptable products:
      a. W.R. Meadows Co., SealTight 1100 Clear Curing Compound.
      b. Degussa Building Systems, Kure-N-Seal.
      c. Symons, Resi-Chem Clear.
   3. Location: Use Liquid Curing Compound at all slab-on-grade locations specified to receive carpet, resilient VCT flooring, terrazzo, ceramic or quarry tile.

C. Penetrating Concrete Hardener:
   1. Type: A ready-to-use, dry-shake, colored or uncolored hardener.
   2. Verify slab preparation compatibility with curing and sealing compound.
   3. Acceptable products:
      a. W.R. Meadows Co., Type-R Premix.
      b. Degussa Building Systems, Maximent.
      c. Symons, Hard Top.
   4. Location: Use Concrete Hardener at exposed interior concrete floor slabs in areas not scheduled to receive additional finish or where noted on the Finish Schedule.

D. Epoxy Concrete Bonding Agent:
   1. Characteristics: Two-component, 100 reactive, epoxy resin bonding adhesive Types I and II, Grade 2, Class C.
   2. Acceptable products:
      a. Euclid Chemical Co., Euco #452 MV Epoxy System.
      b. Sika Chemical Corp., Sikadur 32, Hi-Mod.
      c. Degussa Building Systems, Sonoplex.
   3. Location: Use where noted on the Finish Schedule.

2.02 SLIP RESISTANT TREATMENT

A. Abrasive Aggregate: 95 percent minimum fused homogeneous aluminum oxide.
   1. After floating and while the surface is still plastic, uniformly broadcast aluminum oxide particles onto surface at the rate of 25 pounds per 100 sq. ft. Trowel particles into surface to provide embedment but do not force below surface. Use for exposed floors and slabs which constitute ramps with slope of 6 percent or greater, exposed stair treads, and as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. See individual Floor Finish - Division 09 requirements for allowable vapor emission and floor flatness requirements.

3.02 FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1R.

B. Finishing of Formed Surfaces:
   1. Rough form finish:
      a. Leave surfaces with the texture imparted by forms, except patch tie holes and defects.
      b. Remove fins exceeding 1/4 inch in height.
      c. Use for below grade exterior cast-in-place foundation walls and concealed spaces.
   2. Smooth form finish:
      a. Coordinate as necessary to secure form construction using smooth, hard, uniform surfaces, with number of seams kept to a practical minimum and in a uniform and orderly pattern.
      b. Patch tie holes and defects.
      c. Remove fins completely.
      d. All interior and exterior cast-in-place concrete surfaces exposed to view but receiving an additional finish covering (excluding paint) shall receive a smooth formed finish.
   3. Smooth rubbed finish:
      a. Produce on newly hardened concrete no later than the day following form removal.
      b. Wet the surfaces, and rub with carborundum brick or other abrasive until uniform color and texture are produced.
      c. Do not use a cement grout other than the cement paste drawn from the concrete itself by the rubbing process.
      d. All interior and exterior cast-in-place concrete surfaces exposed to view with no finish coating other than paint shall receive a smooth rubbed finish.
   4. Grout cleaned finish:
      a. Do not start cleaning operations until all contiguous surfaces to be cleaned are completed and accessible.
      b. Do not permit cleaning as the work progresses.
      c. Mix one part Portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.
      d. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or spray gun.
      e. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.
      f. While the grout is still plastic, remove all excess grout by working the surface with a rubber float, sack, or other means.
      g. After the surface whites from drying (about 30 minutes at normal temperatures), rub vigorously with clean burlap.
      h. Keep the surface damp for at least 36 hours after final rubbing.
      i. Use for repair of exposed finish surfaces to receive paint or clear sealer.
   5. Medium sandblast finish:
      a. Concrete must have cured a minimum of 14 days prior to sandblasting.
      b. Perform sandblasting finishing in as continuous an operation as possible, utilizing same work crew to maintain continuity of finish on each surface or area of work.
      c. Maintain depth of cut and general aggregate exposure to match field sample.
      d. Use sharp quartz sand under sufficient air pressure to remove dirt, form oil and other foreign materials, and roughen surface to provide a proper bond.
      e. After sandblasting to required finish, wash to clean exposed aggregate surfaces to match Gardner Spencer Smith Tench and Jarbeau, PC's sample.
      f. Use where plywood or other smooth forms have been furnished for exterior concrete surfaces to receive portland cement plaster coat finish.
   6. Sacking finish:
      a. Do not start sacking until patching and filling of holes has been completed.

b. Entire sacking operation for any continuous area shall be started and completed within the same day.
c. Mix one part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having consistency of thick paint.
d. Wet surface of concrete sufficiently to prevent absorption of water from grout.
e. Apply grout uniformly with a brush or spray gun, then immediately float surface with a cork or other suitable float, and rub.
f. While grout is still plastic, finish surface with a sponge-rubber float, removing excess grout.
g. Allow surface to dry thoroughly, then rub vigorously with dry burlap to completely remove dried grout.
h. No visible film or grout shall remain after rubbing with burlap.
i. Use for exposed concrete curbs, and where indicted.

C. Finishing Slabs:
1. Uniformly spread, screed and consolidate concrete. Do not spread concrete by vibration.
2. Float Finish:
a. Float with hand float or with a powered disc float. High spots to be cut down and low spots to be filled.
b. Use as preparation for further finishing.
3. Troweled Finish:
a. After floating, steel trowel to smooth, mark free surface.
b. Use for exposed floors and slabs to receive carpeting and/or resilient flooring and where indicated.
4. Fine Broom Finish:
a. After floating and while the surface is still plastic, provide a fine textured finish by drawing a fine fiber bristle broom uniformly over the surface in one direction only.
b. Use exposed for floors and slabs to receive ceramic tile using the thin set setting method and where indicated.
c. Apply broom finish to all exterior exposed concrete deck slabs.
5. Slip Resistant Finish:
a. After floating a non-slip rotary finish and while the surface is still plastic, uniformly broadcast aluminum oxide particles onto surface at the rate of 30 pounds per 100 sq. ft. evenly installed by dust-on method and embedded into surface during first troweling operation. Trowel particles into surface to provide embedment but do not force below surface. Additional abrasive grains, in amount of 30 pounds per 100 square feet, shall then be evenly installed and embedded into surface during final troweling operation.
b. Use abrasive finish for concrete stair treads, landings, ramps and steps on interior and exterior of buildings, and interior exposed floors and slabs in maintenance, utility and locker room areas, if no other finish is specified.

3.03 FLOOR SURFACE TREATMENT

A. Curing:
1. Cure concrete surfaces in accordance with ACI 301.
2. Application of compound shall be by a trained applicator acceptable to compound manufacturer.
3. Concrete shall be maintained above 50 degrees F., and in a moist condition for 7 days after placing, except that high early strength concrete shall be maintained in a moist condition for 3 days.
4. Before applying curing paper, interior floor treated with colored hardener shall be given a heavy protective coat of colored wax left unpolished, and then immediately covered with paper. If wax is not applied within two hours after final troweling, concrete shall be sprayed with a fine water mist and maintained continuously moist until wax is applied, unless spraying is not recommended by hardener manufacturer. After other Work such as

plastering and painting has been completed, curing paper shall be removed and waxed floors cleaned of protective wax coating.

5. Forms containing concrete, top of concrete between forms, and exposed concrete surfaces after removal of forms shall be maintained in a thoroughly wet condition for at least 7 consecutive days after placing.
6. If weather is hot or surface has dried out, spray surface of concrete slabs and paving with fine mist of water, starting not later than 2 hours after final troweling and continuing until sunset. Surface of finish shall be kept continuously wet until curing medium has been installed.
7. Immediately after finishing, roof slabs and monolithic floor finish to receive resilient floor covering shall be uniformly and completely coated with liquid curing compound.
    a. Install compound in a manner and quantity sufficient to produce a uniform continuous thin film of water-impervious membrane. Compound shall be installed in accordance with manufacturer's directions.
    b. Protect adjoining surfaces from damage during installation. If curing compound is not applied immediately, cover finished concrete with wet burlap or curing paper and keep concrete surface wet for a period not to exceed thirty hours following finishing of concrete. At end of that time, burlap or paper shall be removed and curing compound installed as specified above.
8. Immediately after finishing, monolithic floor slabs not scheduled to receive resilient floor covering shall be covered with curing paper. Paper shall be lapped 3 inches at joints and sealed with waterproof sealer. Edges shall be cemented to finish. Repair or replace paper damaged during construction operations.
9. Within 24 hours after finishing, exterior slabs and paving, and interior slabs to receive cement topping or mortar setting beds, shall be covered with sand to a depth of 2 inches and kept thoroughly wet for 7 days.
    a. Instead of sand covering, exterior walks and paving where no other surface treatment is specified, may be cured with clear liquid curing compound immediately installed in accordance with manufacturer's directions.

B. Sealing:
1. Apply sealing compound on finished floor slab surfaces that are not to receive a finished floor covering and are indicated to be exposed and sealed.
2. Apply sealing compound immediately following finishing operation.
3. Apply sealing compound in sufficient quantities to keep entire surface wet for a minimum of 30 minutes.
4. Lightly mist surface with water as compound is absorbed into surface.
5. Flush surface with water and squeegee surface free of excess compound.

C. Hardener:
1. Exposed interior concrete floors throughout shall be treated with floor hardener, as specified. Install hardener after surface of concrete has reached the point where no excess moisture is present, but while it is still plastic. Hardener shall be installed as follows:
2. Colored Hardener: Install at rate of 40 pounds per 100 square feet of surface for initial application.
3. Gray (natural) Hardener: Install at rate of 20 pounds per 100 square feet of surface for initial application.
4. Hardener shall be evenly distributed and thoroughly floated into surface mortar with a wood float. An additional 20 pounds of hardener, colored or gray, specified as above, shall be installed over each 100 square feet, and troweled to an even surface having uniform color and texture.

D. Apply slip resistant finish to scheduled floor surfaces in accordance with manufacturer's instructions.

3.04 TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for flatness.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
   1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
   2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
   3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
   4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
   5. Under Portland Cement Terrazzo: F(F) of 50; F(L) of 50, on-grade only.

C. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.05 PROTECTION

A. Protect freshly placed concrete from damage due to water, falling objects or persons marring finish surface of concrete. Surfaces damaged due to lack of protective measures shall be removed and replaced with fresh concrete.

B. Protect concrete surfaces and finishes to be left exposed from damage during subsequent construction operations and make necessary repairs to damaged areas, returning to original condition.

C. Areas requiring patching shall not exceed two square feet per 1000 square feet of surface area. Areas having excessive defects, as determined by the Gardner Spencer Smith Tench and Jarbeau, PC, shall be removed and replaced.

D. Following the finishing operation, patch voids, honeycombs, form tie holes and defects using a mixture of similar proportions to original concrete, deleting coarse aggregate where necessary.

E. In preparing areas to receive patch, remove loose pieces and chip out adjacent sound concrete to avoid featheredge conditions.

F. Apply a coating of bonding agent to areas being patched. Take care to prevent staining of exposed surfaces. Apply bonding agent in accord with manufacturer's product recommendations.

G. Fill in area with selected mix, bringing to same level as original concrete. Brush out area to match surrounding work. Allow to cure.

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 01 4110 - Testing Laboratory Services.

B. Section 040070 - Cement Grout for Reinforced Masonry.

C. Section 040090 - Masonry Accessories.

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

E. Section {\id\#1000535} - Manufactured Mosonry Veneer

F. 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 2018.

D. ASTM C91/C91M - Standard Specification for Masonry Cement 2018.

E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2021a.

F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2018.

G. ASTM C150/C150M - Standard Specification for Portland Cement 2020.

H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2018.

I. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019.

J. ASTM C476 - Standard Specification for Grout for Masonry 2020.

K. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2020.

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

M. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry 2020.

N. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength 2019.

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 ASTM C270 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 ASTM C476 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 TMS 402/602, 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.

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: ASTM C270, 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: ASTM C207, 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 is Blue Circle Color Putty Portland.

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. The Burke Company, Burke Plug.
      b. Lambert Corp., Super Por-Rok.
      c. Miniwax Construction Products Division, Super Por-Rok.
      d. Harris Specialty Chemicals, Inc., Thorogrip.
      e. W.R. Bonsal Company, Instant Hydraulic Cement.
   2. Characteristics: Quick-setting, self-leveling, pourable cement base; waterproof, non-shrinking hydraulic compound.

J. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

K. 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 ASTM C270 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, 042200 - Concrete Unit Masonry and 047200 - Cast Stone Masonry 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.
    1. Test with same frequency as specified for masonry units.
    2. Test with same frequency as specified for masonry units.

B. 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 4200
EXTERIOR STONE CLADDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cut Stone, Matching Existing veneer at exterior walls.

B. Metal anchors and supports.

C. Sealing exterior joints.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Flashings at copings, lintels, and sills.

B. Section 07 9200 - Joint Sealants: Sealing perimeter and expansion joints in interior stone work.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications 2020a.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

C. ASTM C119 - Standard Terminology Relating to Dimension Stone 2020.

D. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.

H. ASTM C1528/C1528M - Standard Guide for Selection of Dimension Stone 2020.

I. NBGQA (SPEC) - Specifications for Architectural Granite, Version 18-1 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

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

B. Product Data: Provide data on stone, mortar products, and sealant products.

C. Shop Drawings: Indicate layout, pertinent dimensions, anchorages, head, jamb, and sill opening details, and jointing methods.

D. Samples: Submit two stone samples 12 by 12 inch in size, illustrating color range and texture, markings, surface finish, and [_____].

E. Samples: Submit mortar color samples.

F. Installation Instructions: Submit stone fabricator's installation instructions and field erection or setting drawings; indicate panel identifying marks and locations on setting drawings.

1.06 QUALITY ASSURANCE

A. Design anchors and supports under direct supervision of a Professional Structural Engineer, registered in Georgia.
   1. Design anchors to resist positive and negative wind pressures and other loads as required by applicable code.
   2. Design anchor attachment to stone with a factor of safety of 5:1.
   3. Design each individual anchor with a factor of safety in the vertical dead-load-bearing direction of 4:1 and in the horizontal lateral-load-bearing direction of 2:1.

1.07 MOCK-UP

A. Construct stone wall mock-up, 4 feet long by 4 feet wide, including stone anchor accessories, sill and head flashings , corner condition , typical control joint .

B. See Section 01 4000 - Quality Requirements for additional requirements.

C. Locate where directed.

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

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store stone panels vertically on edge, resting weight on panel edge.

B. Protect stone from discoloration.

1.09 FIELD CONDITIONS

A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

1.10 SPECIAL BUILDING ENCLOSURE WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 STONE

A. Stone, General: See recommendations in ASTM C1528/C1528M.

2.02 MORTAR

A. Mortar: ASTM C270, Type N, Proportion specification, using Portland cement of white color.

B. Mortar: As specified in Section 04 0511.

2.03 ANCHORS AND ACCESSORIES

A. Anchors and Other Components in Contact with Stone: Stainless steel, ASTM A666 Type 304.
   1. Sizes and configurations: As required for vertical and horizontal support of stone and applicable loads.
   2. Wire ties are not permitted.

B. Support Components not in Contact with Stone: Stainless steel, ASTM A240/A240M Type 304.

C. Setting Buttons and Shims: Lead type.

D. Flashings: Specified in Section 07 6200.

E. Joint Sealant: ASTM C920 silicone sealant with movement capability of at least plus/minus 25 percent and non-staining to stone when tested in accordance with ASTM C1248.

F. Joint Backer Rod: ASTM C1330 open cell polyurethane of size 40 to 50 percent larger in diameter than joint width.

G. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.04 STONE FABRICATION

A. Thickness: 3/4 inch, Match Existing.

B. Panel Size: As indicated on drawings.

C. Fabrication Tolerances: In accordance with NBGQA (SPEC).

D. Fabricate units for uniform coloration between adjacent units and over the full area of the installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support work and site conditions are ready to receive work of this section.

B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

A. Clean stone prior to erection. Do not use wire brushes or implements that will mark or damage exposed surfaces.

3.03 INSTALLATION

A. Install flashings of longest practical length and seal watertight to back-up. Lap end joint minimum 6 inches and seal watertight.

B. Erect stone in accordance with stone supplier's instructions and erection drawings.

C. Set stone with a consistent joint width of 3/8 inch, Match Existing.

D. Install anchors and place setting buttons to support stone and to establish joint dimensions.

E. Joints in Exterior Work: Seal joints with joint sealant over backer rod, following sealant manufacturer's instructions; tool sealant surface to concave profile.

F. Joints in Interior Work: Leave perimeter joints and expansion joints open for sealant; fill other joints with pointing mortar; pack and work into voids; tool surface to concave joint.

3.04 TOLERANCES

A. Positioning of Elements: Maximum 1/4 inch from true position.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet; 1/2 inch in 50 feet.

C. Maximum Variation Between Face Plane of Adjacent Panels: 1/16 inch.

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

E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch maximum.

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

3.05 CUTTING AND FITTING

A. Obtain approval prior to cutting or fitting any item not so indicated on drawings.

B. Do not impair appearance or strength of stone work by cutting.

3.06 CLEANING

A. Remove excess joint material upon completion of work.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

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 2016a.

D. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010 (Reapproved 2017).

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

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 2018.

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

K. PS 20 - American Softwood Lumber Standard 2020.

L. NLGA - National Lumber Grades Authority.

M. SPIB (GR) - Grading Rules 2014.

N. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17 2018.

O. WWPA G-5 - Western Lumber Grading Rules 2017.

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 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

C. Section 09 9000: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. APA - Standards of the American Plywood Association.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1 2017, with Errata (2019).

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. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.

G. NFPA - National Fire Protection Association.

H. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress 2015.

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

J. UL - Underwriters Laboratories, Inc.

K. 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.

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

1.05 SUBMITTALS

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

B. Product Data:
   1. Provide data on fire retardant treatment materials and application instructions.
   2. Provide instructions for attachment.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.

D. Samples for Verification: For each species and cut of lumber and panel products with nonfactory-applied finish, with 1/2 of exposed surface finished, 50 sq. in. for lumber and 12 inches square for panels.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.

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 finish carpentry with sequenced-matched wood veneers.

F. Comply with the following as a minimum requirement:
   1. Douglas fir finish lumber shall be manufactured and graded in accordance with WCLIB - Standard Grading and Dressing Rule No. 17.
   2. Hardwood finish lumber shall be manufactured and graded in accordance with NHLA - Rules for the Measurement and Inspection of Hardwood and Cypress Lumber.
   3. Softwood Plywood: Plywood shall comply with APA - Product Standard PS 1-95. Plywood shall be grade marked by APA.
   4. Finish lumber shall be kiln-dried according to recognized methods for the thickness and species. Lumber one inch thick or less shall be dried to an average moisture content of not more than 15 percent. Lumber 1-1/4 inches to 2 inches in thickness shall be dried to an average moisture content of not more than 19 percent.

G. Fire Test Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS or another testing and inspection agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of material that will be concealed from view after installation.

H. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

I. Quality Certification:
   1. Provide labels or certificates indicating that the work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
   5. Arrange and pay for inspections required for certification.
   6. Replace, repair, or rework all work for which certification is refused.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire retardant requirements.

1.08 MOCK-UP

A. Before fabricating and installing finish carpentry, build mock-ups for each form of construction and finish required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mock-ups to comply with the following:
   1. Build mock-ups in the location and of the size indicated or, if not indicated, as directed by Gardner Spencer Smith Tench and Jarbeau, PC.
   2. Notify Gardner Spencer Smith Tench and Jarbeau, PC seven days in advance of dates and times when mock-ups will be installed.
   3. Locate where directed.
   4. Demonstrate the proposed range of aesthetic effects and workmanship.
   5. Obtain Gardner Spencer Smith Tench and Jarbeau, PC's approval of mock-ups before starting interior finish carpentry fabrication.
   6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Mock-up may remain as part of the Work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

B. Materials shall be delivered to the Project site in undamaged condition, stored in fully covered, well ventilated areas, and protected from extreme changes in temperature and humidity.

C. Interior millwork and finish carpentry shall not be installed unless interior building temperature and humidity levels are within the ranges recommended by the manufacturer and/or recognized standards.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

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

C. Coordinate the work with installation of associated and adjacent components.

D. Field measurements: Take field measurements to ascertain exact sizes for millwork fabrication. Indicate exact dimensions on shop drawings.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by the American Lumber Standards' Committee Board of Review.

C. Hardwood Plywood: HPVA HP-1.

D. Hardboard: AHA A135.4

E. Medium Density Fiberboard: ANSI A208.2, Grade MD.

F. Particleboard: ANSI A208.1, Grade M-2.

G. Moisture content: 19% maximum moisture content at time of permanent closing in of building, except as otherwise specified.

H. Surfacing: Surface four sides (S4S), unless otherwise noted.

I. Grades for exposed and semi-exposed finish carpentry and millwork lumber and plywood are based on AWI Quality Standards, unless otherwise specified. Grades for unexposed work are based on referenced grading rules.

2.02 INTERIOR STANDING AND RUNNING TRIM

A. Hardwood Lumber Trim for Transparent Finish (Stain or Clear Finish): Clear, kiln-dried, Finished lumber (S4S).

B. Lumber Trim for Opaque Finish (Painted): Finished lumber (S4S), either finger-jointed or solid lumber, fabricated from any closed grain hardwood.

C. Mouldings: Provide in profiles indicated.

2.03 LUMBER MATERIALS

A. Species and grades:
1. Unexposed millwork framing and blocking: Standard Grade Lumber.

B. Exposed and semi-exposed painted millwork and trim:
1. Species: Poplar, FAS grade, or White Pine, B and Better grade; kiln-dried.
2. Cut: Plain sawn.
3. AWI Lumber Grade: II.

C. Exposed and semi-exposed stained millwork and trim:
1. Species: Red Oak, FAS grade, kiln-dried.
2. Cut: Plain sliced.
3. AWI Lumber Grade: II.

D. Hardwood Lumber: Red Oak species, Rotary Cut sawn, maximum moisture content of 6 percent ; with vertical grain , of quality suitable for transparent finish.
1. Pencil Sharpener's Size: 3-inch by 5-inch by 3/4-inch.

2.04 FACTORY WOOD TREATMENT

A. 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.

B. 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. Osmose, Inc: www.osmose.com.
e. Substitutions: See Division 01 - Product Requirements.
2. 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 rating of 25 when tested in accordance with ASTM E 84, 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. All interior rough carpentry items are to be fire retardant treated.
c. Treat rough carpentry items as indicated .
d. Do not use treated wood in applications exposed to weather or where the wood may become wet.

2.05 SHELVING AND CLOTHES RODS

A. Shelving: 3/4 inch boards of same species and grade indicated above for lumber trim for opaque finish.
   1. Shelf Cleats: 3/4 by 3-1/2 inch boards or where indicated, 3/4 by 5-1/2 inch boards with holes to receive clothes rods, of same species and grade indicated above for interior lumber trim for opaque finish.
   2. Shelf Brackets: Prime painted formed steel with provision to support clothes rod where rod is indicated.
   3. Clothes Rods: 1-1/2-inch- diameter, clew-, kiln-dried softwood rods; either douglas fir or southern pine.

2.06 ADHESIVE

A. Adhesive: Type recommended by laminate manufacturer to suit application .

2.07 FASTENINGS

A. Fasteners: Concealed of size and type to suit application.

B. Concealed Joint Fasteners: Threaded steel.

2.08 ACCESSORIES

A. Wood Filler: Solvent base, tinted to match surface finish color.

2.09 WOOD TREATMENT

A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84; [_____] manufactured by [_____].

B. Wood Preservative by Pressure Treatment (PT Type): AWPA Treatment C2 using water borne preservative with 0.25 percent retainage.

C. Provide identification on fire retardant treated material.

D. Redry wood after pressure treatment to maximum 15 percent moisture content.

2.10 FABRICATION

A. General:
   1. The means of fastening various parts together shall be concealed in finished Work. Work, which is curved, shall be fabricated from solid stock, or if veneered, shall be bent to a uniform radius.

B. Shop assemble work for delivery to site.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

D. Wood Moisture Content: Comply with requirements of specified inspection agencies and with manufacturer's written recommendations for moisture content of finish carpentry at relative humidity conditions existing during time of fabrication and in installation areas.

E. Back out or kerf backs of the following members, except members with ends exposed in finished work:
   1. Interior standing and running trim, except shoe molds.
   2. Wood board paneling.

F. Ease edges of lumber less than 1 inch in nominal thickness to 1/16 inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8 inch radius.

2.11 SHOP FINISHING

A. Shop finish sheet materials in accordance with specified quality standard:
   1. Transparent Finish: Transparent conversion varnish, Premium quality, satin gloss sheen.

B. Sand work smooth and set exposed nails and screws.

C. Apply wood filler in exposed and screw indentations.

D. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

E. Finish work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Section 1500, System TR-2 (Transparent).

F. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

C. With Installer present, examine substrates, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours, unless longer conditioning is recommended by the manufacturer.

3.03 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Anchor work secured to supports and substrates using concealed fasteners and blind nailing where possible. Where exposed nailing is required use fine finishing nails; deep set below wood surfaces and filled flush with wood putty matching wood species and finish. Sand putty filled holes smooth with adjacent surfaces.

E. Distribute visual defects allowed in the quality grade specified to the best overall advantage when installing job assembled work to provide for uniform and consistent appearance.

F. Finish work shall be smooth, free from abrasion, tool marks, raised grain, grade markings or similar defects on exposed surfaces.

G. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

H. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
4. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate finish carpentry.

3.04 INSTALLATION OF STANDING AND RUNNING TRIM

A. Install trim and molding in single, continuous, unjointed lengths for openings and runs less than 10'-0". For longer runs, provide in minimum 10'-0" lengths in straight runs with minimum number of joints and limiting one piece in the overall run to be less than 10'-0". Cope at returns and miter at corners to provide tight fitting joints.
   1. Match color and grain pattern across joints.
   2. Install trim after gypsum board joint finishing operations are completed.
   3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

B. Avoid field splices in trim and moldings where practicable. If required, make with scarfed (diagonal) joints; glued and nailed. Stagger joints in adjacent members of multi-component trim and molding.

C. Provide back blocking for attachment and support for large single piece or multi-membered moldings.

D. Install work with adequate provisions to allow for thermal and differential movement of building.

E. Attach and secure work in place with uniform joints. Secure to anchors or blocking built-in to construction or attach directly to compatible substrates.

F. Blind nail trim and moldings where possible; use fine finishing nails where exposed. Set exposed nail heads below surfaces for filling with wood putty.

3.05 ADJUSTING

A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.06 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.07 CLEANING

A. Clean wood, metal and accessory items using a neutral cleaner.

B. Touch up shop-applied finishes to restore damaged or soiled areas.

3.08 PROTECTION

A. Protect installation including factory finished surfaces from the work

B. Touch-up, repair or replace damaged products before Substantial Completion. of other trades. Provide protective coverings as required to prevent damages to surfaces.

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 04 4200 - Exterior Stone Cladding: Stone walls enclosing insulation.

B. Section 072610 - Weather Resistant Membranes: Separate air barrier and vapor retarder materials.

C. 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; GreenGuard XPS TYPE IV 25 PSI: 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 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.

3.05 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.

3.06 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.

3.07 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 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.

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.

D. Section 07 4646 - Fiber-Cement Siding.

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. Exterior Cladding (Wood): Nails with plastic washer heads.
   2. Steel Framing: Rust-resistant screws with washers.
   3. 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 2250 - Nailable Board Insulation: Nailable rigid insulation.

D. Section 07 2710 - Modified Bituminous Sheet Air Barriers.

E. 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 Section 01 3200 - Construction Progress Documentation, 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 Division 01 - Product Requirements.
      5) 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 4646
FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiber-cement siding.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Water-resistive barrier under siding.

B. Section 07 2610 - Weather Resistant Membranes: Weather barrier.

C. Section 07 9005 - Joint Sealers.

D. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under siding.

E. Section 09 9113 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 509-14 - Voluntary Test and Classification Method of Drained and Back Ventilated Rain Screen Wall Cladding Systems

B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

C. ASTM C1186 - Standard Specification for Flat Fiber Cement Sheets 2008 (Reapproved 2016).

D. ASTM E-84 - Standard Test for Surface Burning Characteristics of Building Materials.

E. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

F. ASTM E 228 - Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer.

G. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

H. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

I. National Fire Protection Association (NFPA):
   1. NFPA 285 - Fire Test Method for Exterior Wall Assemblies Containing Combustible Material.

1.04 SUBMITTALS

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

B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's requirements for related materials to be installed by others.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods, including nail patterns.

C. Product Test Reports and Code Compliance: Documents demonstrating product compliance with local building code, such as test reports or Evaluation Reports from qualified, independent testing agencies.

D. Manufacturer’s Details: Submit drawings (.dwg, .rvt, and/or .pdf formats), including plans, sections, showing installation details that demonstrate product dimensions, edge/termination conditions/treatments, compression and control joints, corners, openings, and penetrations.

E. Samples: Submit samples of each product type proposed for use.

F. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.

G. Warranty: Submit copy of manufacturer's warranty, made out in Union County Commissioner's Office's name, showing that it has been registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: All fiber cement panels specified in this section must be supplied by a manufacturer with a minimum of 10 years of experience in fabricating and supplying fiber cement cladding systems.
   1. Products covered under this section are to be manufactured in an ISO 9001 certified facility.
   2. Provide technical and design support as needed regarding installation requirements and warranty compliance provisions.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section with minimum three years of experience.

C. Mock-Up Wall: Provide a mock-up wall as evaluation tool for product and installation workmanship.

D. Pre-Installation Meetings: Prior to beginning installation, conduct conference to verify and discuss substrate conditions, manufacturer's installation instructions and warranty requirements, and project requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products under waterproof cover and elevated above grade, on a flat surface.

B. Panels must be carried on edge. Do not carry or lift panels flat. Improper handling may cause cracking or panel damage.

C. Direct contact between the panels and the ground should be avoided at all times. It is necessary to keep panels clean during installation process.

1.07 WARRANTY

A. See Division 01 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FIBER-CEMENT SIDING

A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying to ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   1. Style: Match Existing.
   2. Texture: Match Existing.
   3. Length: 12 ft, nominal.
   4. Width (Height): Match Existing.
   5. Thickness: Match Existing.
   6. Finish: Factory applied primer.
   7. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturers full range of available colors.
   8. Warranty: 15 year limited; transferable.
   9. Manufacturers:
      a. CertainTeed Corporation : www.certainteed.com.
      b. Basis of Design: James Hardie Building Products, Inc: www.jameshardie.com/#sle.
      c. Nichiha USA, Inc: www.nichiha.com/#sle.
      d. Substitutions: See Division 01 - Product Requirements.

B. Panel Siding: Vertically oriented panels made of cement and cellulose fiber formed under high pressure with integral surface texture, complying to ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   1. Texture: Match Existing.
   2. Length (Height): 96 inches, nominal.

3. Width: 48 inches.
4. Thickness: 5/16 inch, nominal.
5. Finish: Factory applied primer.
6. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturers full range of available colors.
7. Warranty: 15 year limited; transferable.
8. Manufacturers:
    a. CertainTeed Corporation : www.certainteed.com.
    b. Basis of Design: James Hardie Building Products, Inc : www.jameshardie.com.
    c. Nichiha USA, Inc : www.nichiha.com.
    d. Substitutions: See Division 01 - Product Requirements.

C. Trim: Individual boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C 1186 Type A Grade II; with machined edges, for nail attachment.
1. Style: Random width, straight edge.
2. Texture: Match Existing.
3. Length: Longest pratical.
4. Width (Height): Match Existing.
5. Thickness: Match Existing.
6. Finish: Factory applied primer.
7. Color: As selected by Gardner Spencer Smith Tench and Jarbeau, PC from manufacturers full range of available colors.
8. Warranty: 15 year limited; transferable.
9. Manufacturers:
    a. CertainTeed Corporation : www.certainteed.com.
    b. Basis of Design: James Hardie Building Products, Inc : www.jameshardie.com.
    c. Nichiha USA, Inc : www.nichiha.com.
    d. Substitutions: See Division 01 - Product Requirements.

2.02 MATERIALS

A. Fiber cement panels manufactured from a pressed, stamped, and autoclaved mix of Portland cement, fly ash, silica, recycled rejects, and wood fiber bundles.

B. Panel surface pre-finished and machine applied.

C. Panels profiled along all four edges, such that both horizontal and vertical joints between the installed panels are ship-lapped.

D. Factory-applied sealant gasket added to top and right panel edges; all joints contain a factory sealant.

2.03 PERFORMANCE REQUIREMENTS

A. Fiber Cement Cladding - Must comply with ASTM C-1186, Type A, Grade II requirements:
1. Wet Flexural Strength: Result: 1418 psi, Lower Limit: 1015 psi.
2. Water Tightness: No water droplets observed on any specimen.
3. Freeze-thaw: No damage or defects observed.
4. Warm Water: No evidence of cracking, delamination, swelling, or other defects observed.
5. Heat-Rain: No crazing, cracking, or other deleterious effects, surface or joint changes observed in any specimen

B. Magnesium Oxide (MgO) and Magnesium Chloride (MgCL) panel cements are not allowed.

C. Mean Coefficient of Linear Thermal Expansion (ASTM E-228): Max 1.0*10^-5 in./in. F.

D. Surface Burning (CAN-ULC S102/ASTM E-84): Flame Spread: 0, Smoke Developed: 0.

E. Wind Load (ASTM E-330): Contact manufacturer for ultimate test pressure data corresponding to framing type, dimensions, fastener type, and attachment clips. Project engineer(s) must determine Zone 4 and 5 design pressures based on project specifics.

1. Minimum lateral deflection: L/120.

F. Water Penetration (ASTM E-331): No water leakage observed into wall cavity.

G. Steady-State Heat Flux and Thermal Transmission Properties Test (ASTM C-518): 16mm thick panel thermal resistance R Value of 0.47.

H. Fire Resistant (ASTM E-119): The wall assembly must successfully endure 60-minute fire exposure without developing excessive unexposed surface temperature or allowing flaming on the unexposed side of the assembly.

I. Ignition Resistance (NFPA 268): No sustained flaming of panels, assembly when subjected to a minimum radiant heat flux of 12.5 kW/m2 ± 5% in the presence of a pilot ignition source for a 20-minute period.

J. Fire Propagation (NFPA 285): Wall assembly of Nichiha AWP, Ultimate Clips and Starter Track, Tyvek Commercial Wrap, 1/2” Densglass Gold Sheathing, 16” o.c. 18 gauge steel studs, mineral wool in-cavity insulation, and interior 5/8” Type X gypsum met the acceptance criteria of NFPA 285.

K. Fire Propagation (CAN/ULC S-134): Wall assembly of Nichiha AWP, Ultimate Clips and Starter Track, Tyvek Housewrap, 5/8” FRT plywood, 16” o.c. 2x wood studs, fiberglass in-cavity insulation, and interior 5/8” Type X gypsum met the acceptance criteria of CAN/ULC S-134.

L. Drained and Back Ventilated Rainscreen (AAMA 509-14): System classifications: W1, V1.

M. Florida Building Code - Test Protocol HVHZ (TAS 202, 203): Design Pressure: 95 psf.

2.04 ACCESSORIES

A. Aluminum Trim: Paint primed trim as specified in finish schedule.

B. Essential Flashing System:
1. Starter - main segments (3030 mm), inside corners, outside corners.
2. Overhang - main segments (3030 mm), inside corners, outside corners, joint clips.
3. Butt Joint and Horizontal Lap - (3175 mm), 6-inch wide 1-1/4 inch vertical overlap the below course.

C. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch and appropriate to local building codes.

D. Joint Sealer: As specified in Section 07 9005.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.

B. Verify that water-resistive barrier has been installed over substrate completely and correctly.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is responsibility of another installer, notify Gardner Spencer Smith Tench and Jarbeau, PC of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Install Sheet Metal Flashing:
1. Above door and window trim and casings.
2. Above horizontal trim in field of siding.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations.
1. Read warranty and comply with terms necessary to maintain warranty coverage.
2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
3. Use trim details indicated on drawings.

4. Touch up field cut edges before installing.
5. Pre-drill nail holes if necessary to prevent breakage.

B. Vertical Control/Expansion Joints are required, for walls wider than 30 feet, within 2-12 feet of outside corners finished with metal trim and approximately every 30 feet thereafter.

C. Horizontal/Compression Joints: Locate joints at floor lines. Joints are flashed minimum 1/2” breaks. Do not caulk.
1. Wood framed buildings of three or more floors require a compression joint at each floor.
2. Steel framed buildings (including reinforced concrete core) of more than three floors (or 45 feet) require a compression joint every 25 feet at a floor line.

D. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.

E. Over Steel Studs: Use hot-dipped galvanized self-tapping screws, with the points of at least three screws penetrating each stud the panel crosses and at panel ends.

F. Allow space for thermal movement between both ends of siding panels that butt against trim; seal joint between panel and trim with specified sealant.

G. Always cut fiber cement panels outside or in a well ventilated area. Do not cut the products in an enclosed area.

H. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.

I. Joints in Vertical Siding: Install Z-flashing in horizontal joints between successive courses of vertical siding.

J. Do not install siding less than 6 inches from surface of ground nor closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.

K. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations indicated on drawings, and provide vent area specified.

L. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.

M. Finish Painting: Refer to Section 09 9000 - Painting and Coating.

3.04 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

C. Review manufacturer guidelines for detailed care instructions.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including rain diverter.

B. Reglets and accessories.

1.02 RELATED SECTIONS

A. Section 040090 - Masonry Accessories: Exposed and unexposed flashing in masonry.

B. Section 079005 - Joint Sealers.

C. 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) Exposed trim.
    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.

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. Mastic: as recommended by roofing manufacturer.

N. 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.

O. 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.

P. 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.

Q. Bituminous coating: Cold-applied, asphalt mastic meeting SSPC-Paint 12-82, minimum 30 mils thickness.

R. 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.

S. 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 RAIN DIVERTER FABRICATION

A. Acceptable manufacturers:
1. Basis of design: Rain Handler, Product: Rain Dispersal System: www.rainhandler.com.

B. Form sections true to shape, accurate in size, square, and free from distortion or defects.

C. Fabricate sheet metal work in accord with approved shop drawings and applicable standards. Form curved components to radius indicated on the drawings, without deformation in metal.
1. Expansion Joints: Butt type.
2. Accessories: Brackets and associated hardware.

D. Provide linear sheet metal items in 10'-0"to 12'-0" sections, except as otherwise noted. Form flashing using single pieces for the full width. Provide shop-fabricated, one-piece corners and transition pieces.

2.06 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. 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.

2.07 MISCELLEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following material:
1. Stainless Steel: 0.0187-inch (0.5-mm) thick.

2.08 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. Pitch pockets and roof penetrations flashing: Refer to Modified Bituminous Membrane Roofing section for membrane installation.

3.04 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.

3.05 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 4 Section.

C. Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4-inches (100-mm) beyond wall openings.

3.06 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.

3.07 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.

3.08 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 (Reaffirmed 2011).

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

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 2020.

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 Receipt, Storage and Installation of Hollow Metal Doors and Frames 2007.

J. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames 2018.

K. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

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 2019.

O. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2019.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

Q. UL (DIR) - Online Certifications Directory Current Edition.

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 2016.

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. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

H. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

J. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2013.

K. 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.

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 2018a.

D. 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 5313
VINYL WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl fixed windows with impact-resistant glass.

B. Vinyl-framed, factory-glazed windows.

C. Operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 07 2610 - Weather Resistant Membranes: Sealing frames to weather barrier installed on adjacent construction.

B. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

C. Section 08 8000 - GLAZING.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights 2017.

B. AAMA 701/702 - Combined Voluntary Specifications for Pile Weatherstrip and Replaceable Fenestration Weatherseals 2011.

C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.

D. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections 2013.

E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.

F. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

G. ASTM E413 - Classification for Rating Sound Insulation 2016.

H. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.

I. ASTM E1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation 2016.

J. ASTM E1423 - Standard Practice for Determining the Steady State Thermal Transmittance of Fenestration Systems 2014.

K. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems 2014.

L. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes 2017.

M. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights 2019c.

N. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact 2017.

O. NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

P. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week week before starting work of this section.

1.05 SUBMITTALS

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

B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.

C. Samples: Submit full-size or partial full-size sample of vinyl fixed windows illustrating glazing system, quality of construction, and color of finish.

D. Submit two samples of operating hardware.

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

F. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification.
   2. Evidence of WDMA Certification.
   3. Evidence of CSA Certification.
   4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

G. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Cleaning and Maintenance Instructions: Submit manufacturer’s cleaning and maintenance instructions.

K. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Union County Commissioner's Office's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing of type specified and with at least three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

C. Store and handle windows in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

1.09 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Vinyl Windows:

1. Basis of Design: Existing Windows.
2. Alside, Inc: www.alside.com.
3. Atrium Windows and Doors; Series 750: www.atrium.com.
4. Pella Corporation; 250 Series: www.pellacommercial.com.
5. Silver Line; V3 Series: www.silverlinewindows.com.

B. Substitutions: See Division 01 - Product Requirements.

2.02 DESCRIPTION

A. Vinyl Windows: Factory fabricated frame and sash members of extruded, hollow, ultra-violet-resistant, polyvinyl chloride (PVC) with integral color; with factory-installed glazing, hardware, related flashings, anchorage and attachment devices.
   1. Configuration: As indicated on drawings, Match Existing.
      a. Product Type: C - Casement window and FW - Fixed window.
   2. Color: To be selected from manufacturers standard colors, Match Existing.
   3. Size to fit openings with minimum clearance around perimeter of assembly providing necessary space for perimeter seals.
   4. Framing Members: Fusion welded corners and joints, with internal reinforcement where required for structural rigidity; concealed fasteners.
   5. System Internal Drainage: Drain to exterior side by means of weep drainage network any water entering joints, condensation within glazing channel, or other migrating moisture within system.
   6. Glazing Stops, Trim, Flashings, and Accessory Pieces: Formed of rigid PVC, fitting tightly into frame assembly.
   7. Mounting Flange: Integral to frame assembly, providing weather stop at entire perimeter of frame.

B. Performance Requirements: Provide products that comply with the following:
   1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
      a. Performance Class (PC): R.
   2. Design Pressure: In accordance with applicable codes.
   3. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency and passed in accordance with {\rs\#1} for Wind Zone 4 - Additional Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
   4. Condensation Resistance Factor: CRF of 50, minimum, the lower value of the glass and frame window components and determined in accordance with AAMA 1503.
   5. Thermal Transmittance: U-factor of 0.35, maximum, that includes window glazing and frame system based on average window size required for project and determined in accordance with AAMA 1503, ASTM E1423, or NFRC 100.
   6. Forced Entry Resistance (FER): Tested to comply with ASTM F588 requirements having at least Grade 10 performance for each required window assembly.
   7. Acoustical Performance: STC rating of 30, OITC rating of [____] ,when tested in accordance with ASTM E90, ASTM E1425, or AAMA 1801 and ratings derived from ASTM E413 and ASTM E1332, respectively.

2.03 COMPONENTS

A. Glazing: Insulated double pane, Exterior Light Type: Tempered Safety Glass, Interior Light Type: Impact Resistant Laminated PVB, gray tinted, low-E coated, argon filled, with glass thicknesses as recommended by manufacturer for specified wind conditions and acoustic rating indicated.
   1. Glass Stops: Snap-on PVC glazing bead with color to match sash and frame.
   2. Glazing Tape: Closed cell foam type with double sided adhesive.
   3. Setting Blocks: Manufacturer's standard.

B. Frame Depth: 4-1/2 inch.

C. Fasteners: Stainless steel.

D. Accessories: Provide related flashings, anchorage and attachment devices as necessary for full assembly.

E. Glazing Sealant: As specified in Section 07 6100.

F. Exterior Window Sills: Refer to drawings.

G. Sealants for Setting Window Sill Pan Flashing: Provide butyl tape, non-hardening butyl, polyurethane, or silicone sealant; in compliance with ASTM E2112 installation practices.

2.04 HARDWARE

A. Sash lock: Lever handle and keeper with cam lock, provide at least one for each operating sash.

B. Casement/Awning Sash: Steel rotary arm sash operating mechanism with fold-down handle and two bar adjustable hinges and keepers fitted to projecting sash arms with limit stops.

C. Finish of Exposed Hardware: Match Existing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive this work.

B. Examine rough opening to receive vinyl fixed windows.
   1. Verify rough opening is plumb, level, square, and of proper dimensions.
   2. Verify a minimum of 1-1/2 inches of solid wood blocking is installed around perimeter of rough opening.

C. Notify Gardner Spencer Smith Tench and Jarbeau, PC of conditions that would adversely affect installation or subsequent use.

D. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install window unit assemblies in accordance with manufacturers instructions and applicable building codes.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities as necessary.

C. Align window plumb and level, free of warp or twist, and maintain dimensional tolerances and alignment with adjacent work.

D. Set sill members and sill flashing in continuous bead of sealant.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Integrate window installation with exterior weather-resistant barrier using flashing/sealant tape.
   1. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

G. Place interior seal around vinyl window perimeter to maintain continuity of building thermal and air barrier using backer rod and sealant.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

3.04 FIELD QUALITY CONTROL

A. Test installed windows for compliance with performance requirements for water penetration, in accordance with ASTM E1105 using uniform pressure and same pressure difference as

specified for laboratory tests.

3.05 ADJUSTING

3.06 CLEANING

A. Remove protective material from pre-finished surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

C. Do not use harsh cleaning materials or methods that could damage finish, vinyl, or glass.

D. Remove labels and visible markings.

E. Keep weep holes open and clear of obstructions.

F. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer and appropriate for application indicated.

3.07 PROTECTION

A. Protect installed vinyl fixed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

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 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 2020.

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 2017.

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 2018.

H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.

I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.

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 2018.

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 2020.

L. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base 2019.

M. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

N. ASTM E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2010.

O. GA-216 - Application and Finishing of Gypsum Panel Products 2018.

P. GA-600 - Fire Resistance and Sound Control Design Manual, 22nd edition 2018.

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 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 21: Fire Suppression.

D. Division 23: Mechanical.

E. 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 24 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. Standard: 2'-0" by 2'-0".
      b. Style: Match Existing.

c. 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 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 31 3116
TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chemical soil treatment.

1.02 RELATED REQUIREMENTS

A. Section {\id\#1000526} - Cast-In-Place Concrete: Vapor barrier placement under concrete slab-on-grade.

1.03 REFERENCE STANDARDS

A. 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 Certificate: Certify that toxicants meet or exceed specified requirements.

F. Record and document moisture content of soil before application.

G. 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

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