

THE OAKS PHASE VI

254 Apartment Homes Austin, TX
LEDCOR Properties, Inc. San Diego, CA

Archon Corporation
Architecture / Planning

PROJECT MANUAL
FOR
THE OAKS PH. VI
Austin, Texas

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DATE:

6 March 2018

SECTION 000110

TABLE OF CONTENTS

SECTION	TITLE	LATEST ISSUE DATE
DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS		
000010	Cover.....	06Mar18
000011	Project Directory.....	06Mar18
000110	Table of Contents.....	06Mar18
003132	Geotechnical Data.....	06Mar18
007000	General Conditions.....	06Mar18
008000	Supplementary Conditions.....	06Mar18
DIVISION 01 - GENERAL REQUIREMENTS		
011000	Summary.....	06Mar18
012000	Price and Payment Procedures.....	06Mar18
012100	Allowances.....	06Mar18
012200	Unit Prices.....	06Mar18
012300	Alternates.....	06Mar18
013000	Administrative Requirements.....	06Mar18
013216	Construction Progress Schedule.....	06Mar18
014000	Quality Requirements.....	06Mar18
014100	Regulatory Requirements.....	06Mar18
014216	Definitions.....	06Mar18
015000	Temporary Facilities and Controls.....	06Mar18
015300	Mold Prevention Measures.....	06Mar18
015713	Temporary Erosion and Sediment Control.....	06Mar18
016000	Product Requirements.....	06Mar18
017000	Execution and Closeout Requirements.....	06Mar18
017800	Closeout Submittals.....	06Mar18
017900	Demonstration and Training.....	06Mar18
DIVISION 02 - EXISTING CONDITIONS – Not Used		
DIVISION 03 - CONCRETE		
033050	Sheet Vapor Barrier.....	06Mar18
033536	Clear Concrete Sealer.....	06Mar18
035210	Hardrock Concrete Toppings.....	06Mar18
035400	Cast Underlayment.....	06Mar18
Refer to Structural drawings for concrete, reinforcement, formwork, and finishing sections.		
DIVISION 04 - MASONRY		
042000	Unit Masonry.....	21Aug18
044510	Stone Masonry Veneer.....	06Mar18
DIVISION 05 - METALS		
055000	Metal Fabrications.....	06Mar18
055100	Metal Stairs.....	06Mar18
055213	Pipe and Tube Railings.....	06Mar18
DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES		
061000	Rough Carpentry - Structural.....	06Mar18
061100	Architectural Rough Carpentry.....	06Mar18
061120	Composite Wood Railings.....	06Mar18
061750	Plate Connected Wood Trusses.....	06Mar18
062000	Finish Carpentry.....	06Mar18
068200	Glass Fiber Reinforced Plastic.....	06Mar18
DIVISION 07 - THERMAL AND MOISTURE PROTECTION		
071300	Sheet Waterproofing.....	06Mar18
072100	Thermal Insulation.....	06Mar18
072126	Blown Insulation.....	06Mar18
072500	Weather Barriers - Sheet.....	06Mar18
073110	Asphalt Shingles.....	06Mar18

SECTION	TITLE	LATEST ISSUE DATE
---------	-------	-------------------

074113	Metal Roof Panels	06Mar18
074646	Fiber Cement Siding and Soffits.....	06Mar18
076200	Sheet Metal Flashing and Trim	06Mar18
076210	Flexible Flashing	06Mar18
077100	Roof Specialties	06Mar18
077210	Roof Accessories – Steep Slope.....	06Mar18
078400	Firestopping	06Mar18
079005	Joint Sealers	06Mar18

DIVISION 08 - OPENINGS

081413	Preassembled Wood Door and Frame Units.....	06Mar18
081433	Stile and Rail Wood Doors	06Mar18
081550	Insulated Steel Door and Frame Units	06Mar18
083100	Access Doors and Panels	06Mar18
083610	Metal Sectional Overhead Doors	06Mar18
084323	Steel-Framed Entrances and Storefronts.....	06Mar18
085313	Vinyl Windows and Doors	06Mar18
087100	Door Hardware.....	06Mar18
088300	Mirrors.....	06Mar18

DIVISION 09 - FINISHES

092116	Gypsum Board Assemblies	06Mar18
093000	Tiling.....	06Mar18
096500	Resilient Flooring	06Mar18
096800	Carpeting.....	06Mar18
097200	Wall Coverings	06Mar18
098700	Concrete Staining.....	06Mar18
099000	Painting and Coating.....	06Mar18

DIVISION 10 - SPECIALTIES

101400	Signage	06Mar18
101855	Shower Pans – Tile Ready.....	06Mar18
102330	Plastic Wall Vents.....	06Mar18
102800	Toilet, Bath, and Laundry Accessories.....	21Aug18
103050	Manufactured Fireplaces.....	06Mar18
104400	Fire Protection Specialties.....	06Mar18
105523	Mail Boxes.....	06Mar18
105623	Wire Storage Shelving.....	06Mar18
107323	Prefabricated Carport Canopy.....	06Mar18
109900	Miscellaneous Specialties	06Mar18

DIVISION 11 - EQUIPMENT

113100	Residential Appliances	06Mar18
114530	Retractable Stairs.....	06Mar18

DIVISION 12 - FURNISHINGS

122113	Horizontal Louver Blinds – Simulated Wood	06Mar18
122116	Vertical Louver Blinds.....	06Mar18
123530	Residential Casework.....	06Mar18
123600	Countertops.....	06Mar18

DIVISION 13 - SPECIAL CONSTRUCTION – Not Used

DIVISION 14 - CONVEYING EQUIPMENT – Not Used

DIVISION 21 – FIRE SUPPRESSION

DIVISION 22 - PLUMBING

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING

DIVISION 26 - ELECTRICAL

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

DIVISION 31 - EARTHWORK

311000	Site Clearing.....	06Mar18
312000	Earthwork	06Mar18
313116	Termite Control	06Mar18

DIVISION 32 - EXTERIOR IMPROVEMENTS

321313	Concrete Paving.....	06Mar18
321713	Precast Concrete Site Accessories	06Mar18
321723	Painted Pavement Markings	06Mar18
323119	Decorative Metal Fences and Gates	06Mar18
323136	Security Gates and Operators.....	06Mar18

END OF TABLE OF CONTENTS

SECTION 003132

GEOTECHNICAL DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. This document includes information pertaining to geotechnical data.

1.2 INVESTIGATION

- A. An investigation of subsurface soil conditions at the building site was authorized by Owner, and these investigations were documented in a report. A copy of the report are available for Contractor's review from the Architect.

1.3 REPORT

- A. The Geotechnical Investigation Report is for information only, and is not a warranty of subsurface conditions.
- B. The Report is made available for information only, and is not a Contract Document.
- C. The information contained in the Report represents design criteria, recommendations, and guidelines that were utilized as the basis of design for the engineering of the earthwork operations, paving design, and foundation design indicated in the Contract Documents. No changes in this design criteria will be considered or permitted.

1.4 RESPONSIBILITY

- A. Bidders are expected to examine the site and subsurface investigation reports and then decide for themselves the character of the materials to be encountered.
- B. The Architect and Owner assume no responsibility for variations in subsoil conditions, quality, or stability, or for the presence, level, and extent of underground water.
- C. The Architect and Owner assume no responsibility for Bidder's interpretation of data contained in the Report.

END OF SECTION

DOCUMENT 007000

GENERAL CONDITIONS

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 GENERAL CONDITIONS

- A. The "General Conditions of the Contract for Construction", AIA Document A201, Sixteenth Edition, 2007, Articles 1 through 15 inclusive, is a part of this Contract, and is available for review from the Architect. The General Conditions and all modifications listed hereinafter shall apply to all various subcontracts and sub-subcontractors.
- B. Refer to Document 008000 for Supplementary Conditions.

END OF DOCUMENT

DOCUMENT 008000

SUPPLEMENTARY CONDITIONS

1.1 SUPPLEMENTS

- A. The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction", AIA Document A201, **Sixteenth Edition, 2007**. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provision of the Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.2 REFERENCE TO DIVISION 1

- A. With regard to provisions of General Conditions related to project administrative or work-related requirements of the Contract, some of those paragraphs are modified or deleted from General Conditions, and are specified in Division 1, "General Requirements" of the Specifications.

ARTICLE 1 GENERAL PROVISIONS

Add the following new paragraphs:

1.1.9 MISCELLANEOUS DEFINITIONS

1.1.9.1 The term "Product" as used in these Contract Documents includes materials, systems, and equipment.

1.1.9.2 The term "provide" as used in this Project Manual means to furnish and install.

1.1.9.3 Tax Exempt: If the project is identified as tax exempt, "The Owner qualified for exemptions from the State of Texas and local sales and use taxes pursuant to the provisions of the Texas Limited Sales, Excise and Use Tax Act. The Contractor shall not pay any such taxes which would otherwise be payable in connection with the performance of the Contract, but shall instead obtain an exemption by complying with the State Comptroller's requirements. Exemption certificates will be furnished to the Contractor by the Owner."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following new subparagraphs:

1.2.4 The inter-relation of the Project Manual, the Drawings and the schedules is as follows: The Project Manual determines the quality, nature and setting of the several materials; the Drawings establish the quantities, dimensions and details; and the schedules give the location. The documents are to be considered as one and whatever is called for by any one shall be as binding as if called for by all.

1.2.5 Should the drawings disagree in themselves, or with the Project Manual, or if proprietary information disagrees with performance requirements in either the Drawings or the Project Manual, the better quality or greater quantity of the Work or materials shall be estimated upon, and unless otherwise ordered by the Architect in writing, shall be performed or furnished. Should discrepancies or doubt occur, do not proceed with the Work without clarification from the Architect. Contractor shall request clarification in sufficient time to avoid delays and increases in the contract sum.

ARTICLE 3 CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Add following sentences to subparagraph 3.2.2:

3.2.2.1If a dimensional discrepancy exists, Contractor shall take field measurements required for proper fabrication and installation of work. Upon commencement of any item of work, Contractor shall be responsible for dimensions related to such item of Work and shall make any corrections necessary to make work properly fit at no additional cost to Owner.

3.2.2.2Before ordering any material or doing any work, Contractor shall verify dimensions and check conditions in order to assure himself that they properly reflect those on the Drawings. Any inconsistency shall be brought to attention of the Architect. In the event that discrepancies occur between ordered material and actual conditions, of which Architect was not notified beforehand, costs to correct such discrepancies shall be borne by Contractor.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Supplement as provided in Division 1.

3.4 LABOR AND MATERIALS

Add the following new paragraph:

3.4.4 After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements of the Specifications, Division 1. Refer to Division 1 for supplemental information.

3.5 WARRANTY

Supplement as provided in Division 1.

3.8 ALLOWANCES

Supplement as provided in Division 1.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

Supplement as provided in Division 1.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Supplement as provided in Division 1.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Supplement as provided in Division 1.

3.13 USE OF SITE

Supplement as provided in Division 1.

3.14 CUTTING AND PATCHING

Supplement as provided in Division 1.

3.15 CLEANING UP

Supplement as provided in Division 1.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Add the following new paragraph

6.1.5 Coordinated construction work under this Contract includes, but not be limited to, providing concealed blocking as noted for attachment of separate contract items in locations necessary for the actual items to be installed. Providing proper dimensional coordination of separate contract supplied items for general construction work and trim that is to meet and/or adjoin Furniture, Fixtures, Equipment and Accessories.

6.1.6 It is a requirement of the Contractor's work schedule to provide the cooperation, coordination and exchange of information necessary for a timely execution of separate contract work.

ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

Supplement as provided in Division 1.

Add the following new paragraphs:

7.1.4 Except as provided in this article, no oral statement, or direction of Architect or Owner shall be treated as a Change Order or entitle Contractor to an adjustment to the Contract Sum or the Contract Time.

7.1.5 Unit prices shall be inclusive of all costs including mark-up for overhead and profit and shall be applied to units of measure as defined in the Contract Documents for each category of Work.

- 7.1.6 The allowance for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:
 - 7.1.6.1 For the Contractor, for Work performed by the Contractor's own forces, 15 percent of the cost.
 - 7.1.6.2 For the Contractor, for Work performed by the Contractor's Subcontractor, 10 percent of the amount due the Subcontractor.
 - 7.1.6.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, 15 percent of the cost.
 - 7.1.6.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, 10 percent of the amount due the Sub-subcontractor.
 - 7.1.6.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.6.
 - 7.1.6.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$2,000.00 be approved without such itemization.

ARTICLE 8 - TIME

8.3 DELAYS AND EXTENSIONS OF TIME

Add the following new paragraphs

- 8.3.4** Apart from extension of time, no payment or claim for damages shall be made to Contractor as compensation for damages for any ordinary delays or hindrances from any cause whatsoever in the progress of the Work, notwithstanding whether such delay be avoidable or unavoidable.
- 8.3.5** In order to claim an inclement weather delay day, Contractor must:
 - 8.3.5.1** Document, in writing, that the weather on the particular day was of such nature (rain, wind, snow, ice, and subsequent resultant effects) that it significantly impacted its ability to make progress on critical path work items. Inclement weather delay days will not be granted for weekends or holidays unless Contractor can demonstrate that it had been and intended to work on these days. Provide weather station/guage present on site and that all claims must be backed up by that instrument?
 - 8.3.5.2** Submit such delay claims on a weekly basis, not more than 7 days following the day of occurrence.
 - 8.3.5.3** Summarize the number of days claimed for the entire month accompanying each month's application for payment.

ARTICLE 9 PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Supplement as provided in Division 1.

9.3 APPLICATIONS FOR PAYMENT

Supplement as provided in Division 1.

Add the following new subparagraph:

- 9.3.4** Unless otherwise stated in the Owner-Contractor Agreement, the Owner will retain, until Final Payment, 10 percent of the amount due the Contractor on account of progress payments, payable 30 days after Substantial Completion and/or satisfactory evidence to the owner that all payments, bills, and claims have been paid.

Add following Sub-subparagraphs:

- 9.3.5** Monthly Applications for Payment shall include waivers of liens for all work included in previous months' application for payment. Waiver of Liens for subcontractors and materialmen shall be total amount paid prior to previous months' application for payment.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add following Sub-subparagraph **9.5.1.8** to Subparagraph **9.5.1**:

9.5.1.8 Failure to submit written plan indicating action by Contractor to regain time schedule for completion of Work within Contract Time.

9.5.1.9 Failure to keep record documents current.

9.8 SUBSTANTIAL COMPLETION

Supplement as provided in Division 1.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Add the following new paragraph

9.10.2.1 In addition to the items listed in 9.10.2, the Contractor shall deliver 4 sets of the following items to the Owner before final payment will be made:

1. Other close-out submittals as specified in Division 1.
2. Project record documents as specified in Division 1.
3. Operations and maintenance data as specified in Division 1.
4. All warranties as required on specific products or portions of the Work, in format outlined in Division 1.
5. Spare parts, overages, and maintenance materials as outlined in Division 1 and described in the various technical sections.
6. Certificates of occupancy.
7. Copies of all inspection tags from authorities having jurisdiction.
8. Executed Certificate of Substantial Completion.

ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

Add the following new Sub-subparagraphs:

11.1.1.9 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:

Worker's compensation:

Comprehensive General Liability (including Premises – Operations; Independent Contractors; Protective; Products and Completed Operations; Broad Form Property Damage; Contractual):

Property Damage Liability Insurance shall include coverage for the following hazards as applicable:

X (Explosion), C (Collapse), U (Underground).

Comprehensive Automobile Liability

Provide in limits of liability as determined by the Owner.

11.1.1.10 Insurance certificate(s) shall specify Owner as the certificate holder and (except for Workers' Compensation) as an additional insured.

11.1.2 Add the following to the first sentence after the word "law"

"or as otherwise required by the Owner"

11.2 OWNER'S LIABILITY INSURANCE

Delete sub-paragraph in its entirety and substitute the following:

- 11.2.1 The Contractor shall purchase and maintain for the duration of the Contract a standard Owner's and contractor's Protective Liability Policy, as outlined in Paragraph 11.1, naming the Owner and Architect as insured. The Policy shall designate the Contractor and all sub-contractors. The Policy shall be endorsed to provide that the immunity of the Owner from suite shall not be a defense for the insurance company.

11.3 PROPERTY INSURANCE

In the first sentence, replace the word "Owner" with "Contractor".

Add the following sub-paragraph 11.3.1.6:

- 11.4.11 The Contractor shall furnish all insurance called for in paragraph "Property Insurance". The roles of Owner and Contractor when related each to the other are reversed for the purpose of accomplishing Contractor insurance responsibility with the exception that Contractor shall remain responsible for determining need for any additional coverage for his interest.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.5 TESTS AND INSPECTIONS

Supplement as provided in Division 1.

END OF DOCUMENT

SECTION 011000

SUMMARY

PART 1 GENERAL

1.1 PROJECT

- A. Project Name: Top 2, Phase IV, Austin, Texas
- B. Owner's Name: Ledocr Properties Inc., San Diego, California.
- C. Architect's Name: Archon Corporation, Dallas, Texas.
- D. The Project consists of 370 multi-family living units, within 12 - 3 story buildings, known as Top 2, Phase IV, and including a recreation/leasing building, and all associated site development.

1.2 OWNER OCCUPANCY

- A. Owner intends to occupy portions of the Project upon Substantial Completion of each. Confirm phasing of the work to accommodate owner's schedule.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate Owner occupancy.

1.3 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
 - 1. Owner occupancy.
 - 2. Work by Others.
- B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- C. Existing building spaces may not be used for storage.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Price and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.2 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- B. Forms filled out by hand will not be accepted.
- C. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

1.3 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- E. Execute certification by signature of authorized officer.
- F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- H. Submit three copies of each Application for Payment.
- I. Include the following with the application:
 - 1. Transmittal letter as specified for Submittals in Section 013000.
 - 2. Construction progress schedule, revised and current as specified in Section 013000.
 - 3. Current construction photographs specified in Section 013000.
 - 4. Project record documents as specified in Section 017800, for review by Owner which will be returned to the Contractor.
 - 5. Affidavits attesting to off-site stored products.
- J. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.4 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
- B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.
 - 2. Promptly execute the change.
- C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.
- D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
 - 4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- E. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- G. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price.
- H. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- I. Promptly enter changes in Project Record Documents.

1.5 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:

END OF SECTION

SECTION 012100

ALLOWANCES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cash allowances.
- B. Contingency allowance.
- C. Inspecting and testing allowances.
- D. Payment and modification procedures relating to allowances.

1.2 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts , less cost of delivery to site , less applicable taxes .
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing.
- C. Architect Responsibilities:
 - 1. Consult with Contractor for consideration and selection of products , suppliers , and installers.
 - 2. Select products in consultation with Owner and transmit decision to Contractor.
 - 3. Prepare Change Order.
- D. Contractor Responsibilities:
 - 1. Assist Architect in selection of products , suppliers , and installers.
 - 2. Obtain proposals from suppliers and installers and offer recommendations.
 - 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order.

1.3 CONTINGENCY ALLOWANCE

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Contingency Allowance only by Change Order.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.4 INSPECTING AND TESTING ALLOWANCES

- A. Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.
- B. Costs Not Included in the Inspecting and Testing Allowances:
 - 1. Costs of incidental labor and facilities required to assist inspecting or testing agency.
 - 2. Costs of testing services used by Contractor separate from Contract Document requirements.
 - 3. Costs of retesting upon failure of previous tests as determined by Architect.
- C. Payment Procedures:
 - 1. Submit one copy of the inspecting or testing firm's invoice with next application for payment.
 - 2. Pay invoice on approval by Architect.
- D. Differences in cost will be adjusted by Change Order.

1.5 ALLOWANCES SCHEDULE

- A. To be determined.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012200

UNIT PRICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

1.2 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.3 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.4 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- K. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.5 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.6 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.
 - 2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.
- C. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.
- D. The authority of Architect to assess the defect and identify payment adjustment is final.

1.7 SCHEDULE OF UNIT PRICES

- A. To be determined.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Description of alternates.
- B. Procedures for pricing alternates.
- C. Documentation of changes to Contract Price and Contract Time.

1.2 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

1.3 SCHEDULE OF ALTERNATES

- A. To be determined.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 013000

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electronic document submittal service.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Progress photographs.
- F. Submittals for review, information, and project closeout.
- G. Number of copies of submittals.
- H. Submittal procedures.

1.2 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Work covered by each contract, occupancy, .
- B. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.
- C. Section 017800 - Closeout Submittals: Project record documents.

1.3 PROJECT COORDINATION

- A. Project Coordinator: Construction Manager.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 1. Requests for interpretation.
 2. Requests for substitution.
 3. Shop drawings, product data, and samples.
 4. Test and inspection reports.
 5. Manufacturer's instructions and field reports.
 6. Applications for payment and change order requests.
 7. Progress schedules.
 8. Coordination drawings.
 9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the project record.
 2. Contractor and Architect are required to use this service.
 3. It is Contractor's responsibility to submit documents in PDF format.
 4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.

5. Users of the service need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 6. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed.
 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements to not apply to samples or color selection charts.
- B. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.2 PRECONSTRUCTION MEETING

- A. Owner will schedule a meeting after Notice of Award.
- B. Attendance Required:
 1. Owner.
 2. Architect.
 3. Contractor.
- C. Agenda:
 1. Execution of Owner- Contractor Agreement.
 2. Submission of executed bonds and insurance certificates.
 3. Distribution of Contract Documents.
 4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 5. Designation of personnel representing the parties to Contract and Architect.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.3 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.4 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.5 PROGRESS PHOTOGRAPHS

- A. Submit not less than 20 photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Photography Type: Digital; electronic files.
- C. In addition to periodic, recurring views, take photographs of each of the following events:
 - 1. Completion of site clearing.
 - 2. Excavations in progress.
 - 3. Foundations in progress and upon completion.
 - 4. Structural framing in progress and upon completion.
 - 5. Enclosure of building, upon completion.
 - 6. Final completion, minimum of ten (10) photos.
- D. Views:
 - 1. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
 - 2. Consult with Architect for instructions on views required.
 - 3. Provide factual presentation.
 - 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- E. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 - 1. Delivery Medium: Via email.
 - 2. File Naming: Include project identification, date and time of view, and view identification.
 - 3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
 - 4. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.6 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 017800 - CLOSEOUT SUBMITTALS.

3.7 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.8 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.9 NUMBER OF COPIES OF SUBMITTALS

- A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

- A. Transmit each submittal with approved form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Architect review stamps.
- I. When revised for resubmission, identify all changes made since previous submission.
- J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 013216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Preliminary schedule.
 - B. Construction progress schedule, bar chart type.
- 1.2 RELATED SECTIONS
 - A. Section 011000 - Summary: Work sequence.
- 1.3 REFERENCES
 - A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America ; 2004; Thomas E. Glavinich, D.E. P.E.
 - B. M-H (CPM) - CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company; 7th edition, 2009.
- 1.4 SUBMITTALS
 - A. Within 10 days after date of Agreement, submit preliminary schedule to Owner and Architect .
 - B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
 - C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - D. Within 10 days after joint review, submit complete schedule.
 - E. Submit updated schedule with each Application for Payment.
 - F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Owner.
- 1.5 QUALITY ASSURANCE
 - A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

- 3.1 PRELIMINARY SCHEDULE
 - A. Prepare preliminary schedule in the form of a horizontal bar chart.
- 3.2 BAR CHARTS
 - A. Include a separate bar for each major portion of Work or operation.
 - B. Identify the first work day of each week.
- 3.3 REVIEW AND EVALUATION OF SCHEDULE
 - A. Participate in joint review and evaluation of schedule with Architect at each submittal.
 - B. Evaluate project status to determine work behind schedule and work ahead of schedule.
 - C. After review, revise as necessary as result of review, and resubmit within 10 days.
- 3.4 UPDATING SCHEDULE
 - A. Maintain schedules to record actual start and finish dates of completed activities.
 - B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
 - C. Annotate diagrams to graphically depict current status of Work.
 - D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
 - E. Indicate changes required to maintain Date of Substantial Completion.
 - F. Submit reports required to support recommended changes.

3.5 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner , and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 SUBMITTALS

- A. Testing Agency Qualifications:
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 - 1. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.3 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 TESTING AND INSPECTION AGENCIES

- A. Contractor will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 012100; see Section 012100 and applicable sections for description of services included in allowance.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.4 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.5 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment, as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.6 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 014100

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Regulatory requirements applicable to this project are the following (edition and local amendments as adopted by authority having jurisdiction):
- B. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines.
- C. 29 CFR 1910 - Occupational Safety and Health Standards ; current edition; as a work place.
- D. ICC (IFC) - ICC International Fire Code.
- E. NFPA 101 - Life Safety Code.
- F. ICC (IBC) - ICC International Building Code.
- G. ICC (IPC) - ICC International Plumbing Code.
- H. ICC (IMC) - ICC International Mechanical Code.
- I. ICC (IFGC) - ICC International Fuel Gas Code.
- J. NFPA 70 - National Electrical Code
- K. ICC (IEC) - ICC International Electrical Code
- L. Erosion and Sedimentation Control Regulations: Local jurisdiction.
- M. Regulatory requirements as described in each specification Section.

1.2 RELATED REQUIREMENTS

- A. Section 014000 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 014216

DEFINITIONS

PART 1 GENERAL

1.1 SUMMARY

- A. This section supplements the definitions contained in the General Conditions.
- B. Other definitions are included in individual specification sections.

1.2 DEFINITIONS

- A. **Furnish:** To supply, deliver, unload, and inspect for damage.
- B. **Install:** To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- C. **Product:** Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- D. **Project Manual:** The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- E. **Provide:** To furnish and install.
- F. **Supply:** Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Project identification sign.
- I. Field offices.

1.2 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- B. New permanent facilities may be used.
- C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.3 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Internet Connections: Minimum of one; DSL modem or faster.

1.4 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. New permanent facilities may not be used during construction operations.
- C. Maintain daily in clean and sanitary condition.
- D. At end of construction, return facilities to same or better condition as originally found.

1.5 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 FENCING

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.8 SECURITY

- A. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.9 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on Drawings.
- B. Erect on site at location established by Architect.
- C. No other signs are allowed without Owner permission except those required by law.

1.12 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture , drawing rack and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 015300

MOLD PREVENTION MEASURES

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Administrative and procedural requirements to help prevent mold contamination in construction.
- 1.2 SUBMITTALS
 - A. Reports: Submit reports required in this Section, including but not limited to the following:
 - 1. Sightings of existing mold.
 - 2. Window and storefront testing.
 - 3. Moisture contents of materials.
 - 4. Exterior sealant cracks, damage, and deterioration.
- 1.3 QUALITY ASSURANCE
 - A. Preconstruction Meeting: Review requirements of this Section at Preconstruction Meeting.
- 1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING
 - A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - B. Do not bring finish materials into building until building is in a conditioned state. Protect finish materials stored within building. Stage materials off the floor and cover with waterproof covering. Examples of these materials include, but are not limited to, insulation, gypsum products, wall coverings, carpet, ceiling tile, wood products, etc.
 - C. Remove from Project site damaged materials or materials that have become wet. Do not install such materials.
- 1.5 PROJECT CONDITIONS
 - A. Perform daily visual inspections of existing building for existing mold. Report sightings of mold to Owner's Representative.
 - B. Remove water found within building during construction immediately.
 - 1. Energize lift stations and sump pumps as early in Project as possible. Use temporary pumps if necessary to get water out of building and drain lines.
 - C. Ventilation:
 - 1. Verify that existing HVAC system is providing positive pressure in building.
 - 2. Provide adequate air circulation and ventilation during demolition phase(s).
 - 3. Seal off return air ducts and diffusers to prevent construction dust and moisture from entering occupied areas and HVAC system.
 - 4. Provide temporary outside air ventilation as building becomes enclosed.
 - D. Maintain clean project site, free from hazards, garbage, and debris.
 - E. Eating, drinking, and smoking are not permitted within building.
 - F. Slope perimeter grades, both temporary and final grades, away from building structure.
 - G. Verify that condensate pans drain properly beginning with initial installation.
 - H. Flash roof penetrations immediately. Do not allow water to penetrate to floor below.
 - I. Seal window openings prior to window installation with plastic to prevent moisture entry.
 - J. Sprayed-on Fireproofing: Keep air moving throughout building when using sprayed-on fireproofing.
 - K. Cover stored and installed ductwork and installed duct openings with plastic to prevent dust, debris, and moisture from entering ductwork. Repair damaged plastic barrier.
 - L. Do not operate air handling equipment below 60 degrees F supply air temperature until building is 100 percent enclosed.
 - M. Monitor humidity and temperature for conformance to installation requirements defined by material and equipment manufacturers.
 - N. Check moisture content of gypsum board prior to applying finishes. Record findings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Roof Drains: Connect roof drains to risers and storm drainage lines as soon as possible.
- B. Floor Drains: Connect floor drains as soon as possible. Do not cover floor drains with tape or other obstructions during construction. Clean out floor drain lines to mains prior to Substantial Completion.
- C. Wall Assemblies:
 - 1. Install exterior wall insulation, vapor retarder, and gypsum board only after building is enclosed.
 - 2. Keep bottom of installed gypsum board off floor 1/2 inch.
- D. Cavity Conditions: Clean and inspect cavity conditions prior to covering, sealing, or restricting access. Vacuum clean cavity spaces prior to covering or enclosing.
- E. Plumbing: Pressure test plumbing piping identified as insulated on Project prior to installation of insulation.
- F. Roof Mounted Equipment: Inspect rooftop units and other roof-mounted equipment for signs of rain leaks immediately after first rain. Water test with hose immediately after installation. Seal leaks immediately.
- G. Windows and Storefront: Water test windows to manufacturer's and Project Manual's specifications. Record findings and forward to Owner's Representative.
- H. Sealants: Inspect exterior sealants for cracks, damage, or deterioration. Record findings and forward to Owner's Representative.
- I. HVAC Equipment (Permanent HVAC Equipment Used for Temporary Conditioning of Building During Construction Phases): Change filters and clean ductwork interior to remove dirt, dust, debris, and moisture buildup prior to turning Project over to Owner.

3.2 ADJUSTING

- A. Remove damaged materials or materials that have become wet. Replace with new materials.

3.3 DEMONSTRATION

- A. Train and educate Owner's maintenance personnel on use of building systems. Explain how improper operation and shutting down systems during off periods can create mold problems.
- B. Schedule with Owner a review of building for mold problems at 1 year warranty walk-through. Inspect exterior sealants and masonry joints for cracks and other damage or deterioration where water can penetrate building envelope.
- C. Explain to Owner the need for Owner to establish annual building review for mold.

END OF SECTION

SECTION 015713

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 PERFORMANCE REQUIREMENTS

- A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2012 Construction General Permit (CGP) , whether the project is required by law to comply or not.
- B. Also comply with all more stringent requirements of local jurisdiction.
- C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- D. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
- E. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- F. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- G. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 1. Control movement of sediment and soil from temporary stockpiles of soil.
 2. Prevent development of ruts due to equipment and vehicular traffic.
 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- H. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 1. Prevent windblown soil from leaving the project site.
 2. Prevent tracking of mud onto public roads outside site.
 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- I. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- J. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- K. Open Water: Prevent standing water that could become stagnant.
- L. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Erosion and Sedimentation Control Plan:
 - 1. Submit within 2 weeks after Notice to Proceed.
 - 2. Include:
 - a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - e. Other information required by law.
 - f. Format required by law is acceptable, provided any additional information specified is also included.
 - 3. Obtain the approval of the Plan by authorities having jurisdiction.
 - 4. Obtain the approval of the Plan by Owner.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- B. Bales: Air dry, rectangular straw bales.
 - 1. Cross Section: 14 by 18 inches, minimum.
 - 2. Bindings: Wire or string, around long dimension.
- C. Bale Stakes: One of the following, minimum 3 feet long:
 - 1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
 - 2. Wood, 2 by 2 inches in cross section.
- D. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
 - 1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 - 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491.
 - 3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355 after 500 hours exposure.
 - 4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in machine direction; when tested in accordance with ASTM D4632.
 - 5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632.
 - 6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D4533.
 - 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- E. Silt Fence Posts: One of the following, minimum 5 feet long:
 - 1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
- F. Gravel: See Section 321123 for aggregate.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
 - 1. Width: As required; 20 feet, minimum.
 - 2. Length: 50 feet, minimum.
 - 3. Provide at each construction entrance from public right-of-way.
 - 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet..
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 - 2. Straw bale row blocking entire inlet face area; anchor into pavement.
- E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- G. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
- I. Temporary Seeding: Use where temporary vegetated cover is required.

3.4 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Excavate minimum of 6 inches.
 - 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.
- B. Silt Fences:
 - 1. Store and handle fabric in accordance with ASTM D4873.
 - 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 5. Install with top of fabric at nominal height and embedment as specified.
 - 6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 7. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
 - 8. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Straw Bale Rows:
 - 1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 - 2. Install bales so that bindings are not in contact with the ground.
 - 3. Embed bales at least 4 inches in the ground.

4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 5. Fill gaps between ends of bales with loose straw wedged tightly.
 6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
 2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
 3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
 4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
 5. Incorporate fertilizer into soil before seeding.
 6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
 7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
 8. Repeat irrigation as required until grass is established.

3.5 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 2. Remove silt deposits that exceed one-third of the height of the fence.
 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
 1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 2. Remove silt deposits that exceed one-half of the height of the bales.
 3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

3.6 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Owner.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Do not use products having any of the following characteristics:
 - 1. Made outside the United States, its territories, Canada, or Mexico.
 - 2. Made using or containing CFC's or HCFC's.
 - 3. Made of wood from newly cut old growth timber.
- C. Where all other criteria are met, Contractor shall give preference to products that:
 - 1. Are extracted, harvested, and/or manufactured closer to the location of the project.
 - 2. Have longer documented life span under normal use.
 - 3. Result in less construction waste.
 - 4. Are made of vegetable materials that are rapidly renewable.
- D. Provide interchangeable components of the same manufacture for components being replaced.
- E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.2 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.3 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Architect will consider requests for substitutions only within 15 days after date of Agreement.
- C. Substitutions will not be considered when a product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- E. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- G. Substitution Submittal Procedure:
 - 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.2 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.3 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SUBSTITUTION REQUEST FORM

PROJECT: _____

(After Contract Award)

TO: _____

NO. _____

DATE: _____

Contractor hereby requests acceptance of the following product or system as a substitution in accordance with provisions of Division 01 Section "Substitution Procedures:"

1. SPECIFIED PRODUCT OR SYSTEM

Substitution request for: _____

Specification Section No.: _____ Article/ Paragraph: _____

2. REASON FOR SUBSTITUTION REQUEST

SPECIFIED PRODUCT . . .

PROPOSED PRODUCT . . .

- | | |
|---|--|
| <input type="radio"/> Is no longer available. | <input type="radio"/> Will reduce construction time |
| <input type="radio"/> Is unable to meet project schedule. | <input type="radio"/> Will result in cost savings of |
| <input type="radio"/> Is unsuitable for the designated application. | <input type="radio"/> \$ _____ to Project |
| <input type="radio"/> Cannot interface with adjacent materials. | <input type="radio"/> Is for supplier's convenience |
| <input type="radio"/> Is not compatible with adjacent materials. | <input type="radio"/> Is for subcontractor's convenience |
| <input type="radio"/> Cannot provide the specified warranty. | <input type="radio"/> Other: _____ |
| <input type="radio"/> Cannot be constructed as indicated | _____ |
| <input type="radio"/> Cannot be obtained due to one or more of the following: | |
| <input type="radio"/> Strike | <input type="radio"/> Bankruptcy of manufacturer or supplier |
| <input type="radio"/> Lockout | <input type="radio"/> Similar occurrence (explain below) |

3. SUPPORTING DATA

- Drawings, specifications, product data, performance data, test data, and any other necessary information to facilitate review of the Substitution Request are attached.
- Sample is attached.
- Sample will be sent if requested.

4. QUALITY COMPARISON

Provide all necessary side-by-side comparative data as required to facilitate review of Substitution Request:

	SPECIFIED PRODUCT	PROPOSED PRODUCT
Manufacturer:	_____	_____
Name / Brand:	_____	_____
Catalog No.:	_____	_____
Vendor:	_____	_____
Variations:	_____	_____

(Add Additional Sheets If Necessary)

Local Distributor or Supplier: _____

Maintenance Service Available: Yes No

Spare Parts Source: _____

Warranty: Yes No _____ Years

5. PREVIOUS INSTALLATIONS

Identification of at least three similar projects on which proposed substitution was used:

PROJECT #1:

Project: _____

Address: _____

Architect: _____

Owner: _____

Contractor: _____

Date Installed: _____

PROJECT #2:

Project: _____

Address: _____

Architect: _____

Owner: _____

Contractor: _____

Date Installed: _____

6. EFFECT OF SUBSTITUTION

Proposed substitution affects other work or trades: No Yes (if Yes, explain)

Proposed substitution requires dimensional revisions or redesign of architectural, structural, M-E-P, life safety, or other work:

No Yes (if Yes, attach data explaining revisions)

7. STATEMENT OF CONFORMANCE OF REQUEST TO CONTRACT REQUIREMENTS

Contractor and Subcontractor have investigated the proposed substitution and hereby represent that:

- A. They have personally investigated the proposed substitution and believe that it is equal to or superior in all respects to specified product, except as stated above;
- B. The proposed substitution is in compliance with applicable codes and ordinances;
- C. The proposed substitution will provide same warranty as specified for specified product;
- D. They will coordinate the incorporation of the proposed substitution into the Work, and will include modifications to the Work as required to fully integrate the substitution;
- E. They have included complete cost data and implications of the substitution (attached);
- F. They will pay any redesign fees incurred by the Architect or any of the Architect's consultants, and any special inspection costs incurred by the Owner, caused by the use of this product;
- G. They waive all future claims for added cost or time to the Contract related to the substitution, or that become known after substitution is accepted.
- H. The Architect's approval, if granted, will be based upon reliance upon data submitted and the opinion, knowledge, information, and belief of the Architect at the time decision is rendered and Addendum is issued; and that Architect's approval therefore is interim in nature and subject to reevaluation and reconsideration as additional data, materials, workmanship, and coordination with other work are observed and reviewed.

Contractor: _____
(Name of Contractor)

Date: _____ By: _____

Subcontractor: _____
(Name of Subcontractor)

Date: _____ By: _____

Note: Unresponsive or incomplete requests will be rejected and returned without review.

8. ARCHITECT'S REVIEW AND ACTION

- Substitution is accepted.
- Substitution is accepted, with the following comments: _____

- Resubmit Substitution Request:
 - Provide more information in the following areas: _____

 - Provide proposal indicating amount of savings / credit to Owner
 - Bidding Contractor shall sign Bidder's Statement of Conformance
 - Bidding Subcontractor shall sign Bidder's Statement of Conformance
- Substitution is not accepted:
 - Substitution Request received too late.
 - Substitution Request received directly from subcontractor or supplier.
 - Substitution Request not submitted in accordance with requirements.
 - Substitution Request Form is not properly executed.
 - Substitution Request does not indicate what item is being proposed.
 - Insufficient information submitted to facilitate proper evaluation.
 - Proposed product does not appear to comply with specified requirements.
 - Proposed product will require substantial revisions to Contract Documents.

By: _____

Date: _____

Architect has relied upon the information provided by the Contractor, and makes no claim as to the accuracy, completeness, or validity of such information. If an accepted substitution is later found to be not in compliance with the Contract Documents, Contractor shall provide the specified product.

9. OWNER'S REVIEW AND ACTION

- Substitution is accepted; Architect to prepare Change Order.
- Substitution is not accepted.
- Owner will pay Architect directly for redesign fees.
- Include Architect's Additional Service fee for implementing the substitution in the Change Order.

By: _____
(Owner/Owner's Representative)

Date: _____

END OF FORM

END OF SECTION

SECTION 017000

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, except payment procedures.
- I. General requirements for maintenance service.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
 - f. Written permission of affected separate Contractor.
 - g. Date and time work will be executed.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.3 QUALIFICATIONS

- A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located.
- C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.4 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.5 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements , with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.4 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that established by Owner provided survey.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- H. Utilize recognized engineering survey practices.
- I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, invert elevations, and items requested by Owner .
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, and ground floor elevations .
- K. Periodically verify layouts by same means.
- L. Maintain a complete and accurate log of control and survey work as it progresses.
- M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.5 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.6 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-conforming work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- F. Restore work with new products in accordance with requirements of Contract Documents.
- G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.
- I. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.7 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.8 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

- 3.9 SYSTEM STARTUP
- A. Coordinate schedule for start-up of various equipment and systems.
 - B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
 - C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
 - D. Verify that wiring and support components for equipment are complete and tested.
 - E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
 - F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
 - G. Submit a written report that equipment or system has been properly installed and is functioning correctly.
- 3.10 DEMONSTRATION AND INSTRUCTION
- A. See Section 017900 - Demonstration and Training.
- 3.11 ADJUSTING
- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- 3.12 FINAL CLEANING
- A. Execute final cleaning prior to final project assessment.
 - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
 - B. Use cleaning materials that are nonhazardous.
 - C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
 - D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
 - E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
 - F. Clean filters of operating equipment.
 - G. Clean debris from roofs, gutters, downspouts, and drainage systems.
 - H. Clean site; sweep paved areas, rake clean landscaped surfaces.
 - I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- 3.13 CLOSEOUT PROCEDURES
- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and Owner.
 - B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
 - C. Notify Architect when work is considered ready for Substantial Completion.
 - D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
 - E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
 - F. Notify Architect when work is considered finally complete.
 - G. Complete items of work determined by Architect's final inspection.
- 3.14 MAINTENANCE
- A. Provide service and maintenance of components indicated in specification sections.
 - B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
 - C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
 - D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
 - E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 017800

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.2 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect and Owner with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect 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 Owner, 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 Architect 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 Owner'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.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. 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.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.2 OPERATION AND MAINTENANCE DATA

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- D. Provide servicing and lubrication schedule, and list of lubricants required.
- E. Include manufacturer's printed operation and maintenance instructions.
- F. Include sequence of operation by controls manufacturer.
- G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- H. Additional Requirements: As specified in individual product specification sections.

3.5 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. 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.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. 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 Architect, 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.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect , Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.6 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 Owner's permission, leave date of beginning of time of warranty until the 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.
- 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.

END OF SECTION

SECTION 017900

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 SUMMARY

- A. Demonstration of products and systems where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Conveying systems.
 - 6. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
 - 2. Finishes, including flooring, wall finishes, ceiling finishes.
 - 3. Fixtures and fittings.
 - 4. Items specified in individual product Sections.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Submit to Architect for transmittal to Owner.
 - 2. Submit not less than four weeks prior to start of training.
 - 3. Revise and resubmit until acceptable.
 - 4. Provide an overall schedule showing all training sessions.
 - 5. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such as slides, hand-outs, etc.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1. Include applicable portion of O&M manuals.
 - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:
 - 1. Identification of each training session, date, time, and duration.
 - 2. Sign-in sheet showing names and job titles of attendees.
 - 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

1.3 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstration may be combined with Owner personnel training if applicable.
- C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 - 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.2 TRAINING - GENERAL

- A. Conduct training on-site unless otherwise indicated.
- B. Contractor will provide classroom and seating at no cost to Owner.
- C. Provide training in minimum two hour segments.
- D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
- E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
 - 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 - 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 - 3. Typical uses of the O&M manuals.
- F. Product- and System-Specific Training:
 - 1. Review the applicable O&M manuals.
 - 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
 - 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
 - 4. Provide hands-on training on all operational modes possible and preventive maintenance.
 - 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
 - 6. Discuss common troubleshooting problems and solutions.
 - 7. Discuss any peculiarities of equipment installation or operation.
 - 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 - 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 - 10. Review spare parts and tools required to be furnished by Contractor.
 - 11. Review spare parts suppliers and sources and procurement procedures.
- G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 033050

SHEET VAPOR BARRIER

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Sheet materials for controlling vapor diffusion through concrete slabs on grade.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with provisions of Section 01 3000.
- B. Product Data: Manufacturer's descriptive data and installation instructions for sheet vapor barrier and seaming tape.
- C. Samples for Verification: Of sheet membrane vapor barrier, 8 inches x 10 inches.
- D. Test Reports: From independent laboratory indicating compliance with specified requirements.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is acceptable to manufacturer, who has completed applications similar in material and extent to that required for this Project, and whose work has resulted in construction with a record of successful in-service performance.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, bearing manufacturer's labels indicating brand name and directions for storage.
- B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written recommendations for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting materials performance.
- B. Close areas to traffic during installation and for time period after application recommended in writing by manufacturer.

1.7 COORDINATION

- A. Coordinate placement of sheet vapor barrier with applicable Division 03 and 31 Sections.
- B. Job Conditions: Do not install vapor barrier until all below-slab fill and utility work has been completed, tested, and backfilled.
- C. Coordinate installation with scheduled concrete pours to avoid delays. Make provisions for installation of work by other trades.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sheet Vapor Barrier:
 - 1. Type: 10 mil polyolefin film meeting requirements of ASTM E 1745, Class A.
 - 2. Water Vapor Transmittance: ASTM E 154; maximum 0.011 grains per square foot per hour; Maximum perm rating of 0.0223.
 - 3. Tensile Strength: ASTM D 882; minimum 53.2 lbs/in.
 - 4. Puncture Resistance: ASTM D 1709, minimum 2266 grams.
 - 5. Tear Resistance: 7.40 pounds per foot MD per ASTM D 1004.
 - 6. Acceptable Products: Subject to compliance with requirements, provide one of the following:
 - a. Stego Wrap Vapor Barrier by Stego Industries, LLC.
 - b. Griffolyn 10 Mil Green by Reef Industries.
 - c. VaporBlock 10 by Raven Industries.
 - d. Perminator 10 Mil, by W.R. Meadows.
 - e. Substitutions: None permitted.
- B. Accessories:
 - 1. Sealing and Seaming Tape: High density polyethylene tape a minimum of 4" in width, compatible with vapor barrier membrane, and manufactured by or recommended by vapor barrier membrane manufacturer. Tape for joints shall have at least the same permeability rating as the vapor barrier specified.
 - 2. Pipe Boot: Construct pipe boots from vapor barrier material and pressure sensitive tape in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not proceed until under-slab plumbing and electrical rough-in work is complete, and specified fill or subgrade material has been placed, compacted, and tested; and is level and without voids.

3.2 INSTALLATION

- A. Place, protect, and repair vapor barrier sheets according to ASTM E 1643 and manufacturer's written instructions.
- B. Install vapor barrier without tears, voids, and holes. Lap ends and edges as recommended by manufacturer, but not less than 6 inches over adjacent sheets. Seal laps with tape.
- C. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.
- D. Turn up sheets at perimeter, at footings and vertical walls, and against penetrations, and seal joints with tape.
- E. Seal joints, tears, holes, perimeter, and penetrations through vapor with tape.

3.3 PROTECTION

- A. Do not permit unnecessary foot or vehicular traffic on unprotected horizontal membrane.
- B. Protect complete membrane from damage. Prior to pouring concrete, inspect membrane for punctures or damage and repair as required to maintain vapor barrier integrity.

END OF SECTION

SECTION 033536

CLEAR CONCRETE SEALER

PART 1 GENERAL

1.1 SUMMARY

- A. Related Documents: Conditions of the Contract, Division 1 - General Requirements, and Drawings are applicable to Work of this Section.
- B. Section Includes:
 - 1. Clear sealer to be applied to all exposed concrete floors inside building.

1.2 SUBMITTALS

- A. General: Submit in accordance with Section 013000.
- B. Product Data: Submit manufacturer's technical literature, including chemical properties and percentage of solids, for each product.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Performed by firm with 10 years minimum experience in application of sealer required for Project.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of Division 1.
- B. Store products above 50°F, but no greater than 85°F, unless otherwise recommended by manufacturer.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when ambient or substrate surface temperatures are below 40 degrees F or higher than 100 degrees F.
- B. Do not apply during inclement weather or when forecasted conditions will not permit compliance with manufacturer's printed instructions.
- C. Provide mechanical ventilation during and after application to dissipate fumes if natural ventilation is insufficient.

1.6 SEQUENCING AND SCHEDULING

- A. Schedule application of products at proper time intervals after concrete finishing and curing operations.
- B. Maintain proper moisture content of concrete before, during, and after application of specified products.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Liquid Membrane-Forming Sealer (for use on concrete floor slabs intended to be left exposed):
 - 1. Acceptable products:
 - a. Dayton Superior Corporation; Ultraseal; EF.
 - b. Substitutions: Submit in accordance with Section 01 6000.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions and proceed with Work in accordance with Section 01 4000.
- B. Verify that surfaces are clean, dry, dust free, and free of efflorescence, oil or other matter detrimental to sealer application. If required, mechanically abrade surfaces to be coated for proper substrate characteristics.
- C. Verify that joint sealant work in adjoining surfaces is complete prior to applications of sealers. Delay application until sealants have cured.
- D. Ensure concrete has cured for time period required by manufacturer of product to be applied (28 days minimum before application of products).
- E. Verify that damage and defects in concrete surface have been repaired as specified in Section 03 3000 and accepted by Architect.

3.2 PREPARATION

- A. Remove loose particles, foreign matter, and oil by method which will not affect sealer application.
- B. Prepare surfaces in accordance with manufacturer's directions.
- C. Provide protection as necessary to protect adjacent materials and surfaces from dirt, dust, spillage, overspray and other surface or physical damage.

3.3 APPLICATION

- A. General:
 - 1. Provide finishes to match approved samples at locations indicated.
 - 2. Apply materials in accordance with manufacturer's printed instructions.
- B. Liquid Membrane-Forming Sealer:
 - 1. Apply sealer using low pressure airless sprayer in single coat at 250 ft/gal (6.0-7.0 WFT) coverage unless greater amount is recommended by manufacturer to obtain penetration and full coverage.
 - 2. Do not allow flooding or puddling of material on surface.
 - 3. Do not dilute or alter material as packaged.
 - 4. Locations: As indicated on plans and on all exposed concrete flooring inside of building.

3.4 ADJUSTING

- A. Repair or replace adjacent Work which has been damaged by finishing operations.

3.5 CLEANING

- A. Clean spillage, overspray, or drift from adjacent surfaces; remove immediately in accordance with manufacturer's instructions.

3.6 PROTECTION

- A. Protect finished concrete surfaces from damage by construction equipment, operations and from adverse weather conditions.

END OF SECTION

SECTION 035210

HARDROCK CONCRETE TOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide all labor and materials for the proper installation of the Hardrock Concrete Toppings including all supplementary items as required to complete the work as indicated by the Contract Documents.
- B. Applications: Balconies and elevated breezeways and stair access corridors.

1.2 SUBMITTALS

- A. Submit manufacturer's specifications to evidence compliance with these specifications.
- B. Location and placement of control joints in all toppings shall be submitted for approval prior to work commencing.
- C. Submit concrete mix designs indicating the compressive strength, water to cement ratios, aggregate sizes, amount cementitious materials and any admixtures included in the mix designs.
- D. All mix designs submitted shall be identified by a specific number and shall have Independent Testing Laboratory reports indicating the compressive strength of mix design after 28 days from the date of placement.

1.3 QUALITY CONTROL

- A. An Independent Testing Laboratory will take one set of Four (4) concrete test cylinders from each batch truck and location within the building that material is to be placed.
- B. All test cylinders and slump test shall be done in conformance to ASTM C-39 and ASTM C-143.
- C. All concrete shall be "Ready-Mixed in conformance with ACI 211.2 "Recommended Practice for Selecting Proportions for Structural Lightweight Concrete".
- D. All concrete shall be placed in accordance with ACI 301, "Specifications for Structural Concrete Buildings" and ACI - 304, "Guide for Measuring, Mixing, Transporting and Placing Concrete".

1.4 DELIVERY AND STORAGE

- A. Refer to Section 01600 - Material and Equipment
- B. Deliver, store and handle the products in exact accordance with the manufacturer's latest published requirements and specifications.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Portland Cement - ASTM C150 - Type I
- B. Pea Gravel Aggregate - ASTM C-33 as specified.
- C. Water - Clean, potable water, free of trash and debris.
- D. Fiber Reinforcement - ASTM C-1116, 3/4"inch long, 1 1/2 bags per yard.
- E. Air Entraining Admixture- ASTM C-260, 6% minimum or per code
- F. Curing Compound - ASTM C-309, Kurez W VOX, Euclid, water based
- G. Bonding Agent - SBR Latex, Euclid, Polyvinyl acetate or acrylic base
- H. Extruded aluminum T-bar flashing, NF-1853, Non-Ferrous Extrusion & Scrap Metal, Inc., 1-800-929-6063, www.non-ferrous.com.
- I. Sheet metal door pockets, perimeter flashing and wall flashing
- J. Hardrock Concrete Mix - 3,000 PSI compressive strength

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to installation of floor topping, the Subcontractor shall inspect the area to receive the topping placed for any conditions or defects that would affect the proper installation of the product.
- B. Repairing defective work covered up by Subcontractor becomes the responsibility of the Subcontractor.
- C. The commencement of work by the Subcontractor shall imply that the acceptance of the surfaces and areas.

3.2 PREPARATION

- A. Prepare floor by priming floors and sealing all cracks and voids.
- B. Inspect all waterproofing, flashing as detailed and repair any damaged areas of the decking to provide a tight seal prior to installation of concrete topping. Do not place concrete until waterproofing is inspected and approved.
- C. Finish surface shall not vary more than ¼" in 16 feet. Medium wood trowel or broom finish on all areas.
- D. Testing is to be provided in accordance with ASTM C-39 and C143. All testing to be performed by a certified testing laboratory. One set of test cylinders is to be taken from each batch truck and location within building that material is to be placed.
- E. Subcontractor shall protect all adjacent surfaces and clean all excess concrete from metal stairs, edges, pans, siding etc., and from plates where additional work is to be done. Special care shall be taken to protect all adjacent siding, brick, precast stair treads, fascia boards, etc.
- F. Remove all staples and tarpaper used in the protection of exteriors.

3.3 INSTALLATION

- A. Washout of concrete is prohibited on-site, excess to be cleaned up by Subcontractor and removed from the site.
- B. Subcontractor shall be responsible for obtaining water meter and permission to use water from the hydrant from the local public works office.
- C. Repair of all cracks shall be the responsibility of the Subcontractor.
- D. Excessive cracking in toppings shall be grounds for replacement.
- E. Balconies and breezeways shall be provided with tooled control joints placed at 1.5 x the width of the breezeway or balcony on center.
- F. If control joints are not installed, all repairs or replacement of concrete due to cracking shall be the responsibility of Subcontractor.
- G. Protect all water proofing below topping slabs, flashings, stucco wall and other water proofing systems; leakage caused by failure to do so will result in replacement of topping, repair of membranes, and repair of all water damage at the subcontractor's expense.
- H. Exterior concrete wear surfaces shall slope to drain within the first 20'-0" feet of the building exterior.
- I. Concrete shall be poured against adjacent weep screeds, wood trim or other materials.

3.4 CLEANING

- A. Immediately clean up all spills and residue as a result of the work.
- B. Immediately clean all aluminum surfaces and windows of any concrete spills or splashes.

END OF SECTION

SECTION 035400

CAST UNDERLAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Liquid-applied self-leveling floor underlayment.
 - 1. Use gypsum-based type at areas requiring acoustical remediation.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, environmental limitations, and installation instructions.
- C. Certificate: Certify that products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section and approved by manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for combustibility or flame spread requirements.

1.6 FIELD CONDITIONS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gypsum Underlayment:
 - 1. ARDEX Engineered Cements; ARDEX GS-4: www.ardexamericas.com.
 - 2. Maxxon Corporation ; Product Gyp-Crete: www.maxxon.com
 - 3. USG; Levelrock: www.usg.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.2 MATERIALS

- A. Gypsum-Based Underlayment: Gypsum based mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
 - 1. Compressive Strength: Minimum 2500 psi, tested per ASTM C472.
 - 2. Density: Maximum 115 lb/cu ft.
 - 3. Final Set Time: 1 to 2 hours, maximum.
 - 4. Thickness: 3/4 inch.
 - 5. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.
- B. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.
- C. Water: Potable and not detrimental to underlayment mix materials.
- D. Primer: Manufacturer's recommended type.
- E. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.
- F. Underlayment: Acoustimat 1, by Maxxon.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Add aggregate for areas where thickness will exceed 1/2 inch. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.
- C. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum bi-products, or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

- A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.
- C. Vacuum clean surfaces.
- D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.
- E. Close floor openings.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Pump or pour material onto substrate. Do not retemper or add water.
 - 1. Pump, move, and screed while the material is still highly flowable.
 - 2. Be careful not to create cold joints.
 - 3. Wear spiked shoes while working in the wet material to avoid leaving marks.
- C. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.
- D. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

3.4 CURING

- A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.
- B. Air cure in accordance with manufacturer's instructions.

3.5 PROTECTION

- A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.
- B. Do not permit traffic over unprotected floor underlayment surfaces.

3.6 FIELD QUALITY CONTROL (GYPSUM UNDERLAYMENT)

- A. During each day's product application,
 - a. Mold and test one set of 3 test cubes of gypsum concrete in accordance with ASTM C472, and other procedures as recommended by manufacturer. Furnish report on dry density and compressive strength to Architect and Owner upon request.
 - b. Perform one slump test with a 2 inch diameter x 4 inch tall cylinder. Acceptable range of patty after cylinder is removed is 8 inch diameter (+/- 1 inch).

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Concrete Block.
- B. Clay Facing Brick.
- C. Mortar and Grout.
- D. Reinforcement and Anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.
- G. Unless otherwise indicated on Drawings, provide layout for control/expansion joints on building elevations.

1.4 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
- B. Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- C. Mortar Materials: Obtain mortar ingredients of a uniform quality, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.5 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories and structural backup in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for corners, lintels, jambs, sash, control joints, headers, bonding, and other special conditions.
 - 3. Non-Loadbearing Units: ASTM C129.
 - a. Hollow block, as indicated.
 - b. Lightweight.
- B. Decorative Units:

1. ASTM C 90, Type I; medium weight; minimum 3000 psi net compressive strength.
2. Aggregate: Meet requirements of ASTM C 331.
3. Texture and Color: Refer to Finish Legend.

2.2 BRICK UNITS

- A. Facing Brick: ASTM C216, Type FBS, Grade SW.
 1. Color and texture to match Architect's sample.
 2. Nominal size: As indicated on drawings.
 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.3 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91, Type N.
 1. Colored mortar: Premixed cement as required to match Architect's color sample.
- B. Mortar Aggregate: ASTM C144.
- C. Grout Aggregate: ASTM C404.
- D. Water: Clean and potable.
- E. Accelerating Admixture: Non-chloride type for use in cold weather.
- F. Integral Water Repellent Admixture for Mortar and Grout (for use at decorative cmu exposed to the elements): Polymeric liquid admixture added to mortar and grout at the time of manufacture.
 1. Performance of Mortar and Grout with Integral Water Repellent:
 - a. Water Permeance: When tested per ASTM E514 for a minimum of 72 hours.
 - 1) No water visible on back of wall above flashing at the end of 24 hours.
 - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
 - 3) No more than 25% of wall area above flashing visibly damp at end of test.
 - b. Flexural Bond Strength: ASTM C1357; minimum 10% increase.
 - c. Compressive Strength: ASTM C1314; maximum 5% decrease.
 - d. Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
 2. Use only in combination with masonry units produced with integral water repellent admixture.

2.4 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 1. Blok-Lok Limited: www.blok-lok.com.
 2. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
 3. WIRE-BOND: www.wirebond.com.
 4. Substitutions: See Section 016000 - Product Requirements.
- B. Reinforcing Steel: ASTM A615/A615M Grade 40 (280) deformed billet bars; galvanized.
- C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
- D. Single Wythe Joint Reinforcement: Truss or ladder type; stainless steel conforming to ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M; 0.1483 inch side rods with 0.1483 inch cross-rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- E. Masonry Veneer Anchors (for masonry over 3 stories in height): 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 3. Vertical adjustment: Not less than 3-1/2 inches.
- F. Masonry Veneer Anchors (for masonry 3 stories in height or less):
 1. Model No. AA311, 7/8" wide x 7" long minimum (masonry ledge depth plus 4"), corrugated sheet steel, 20 gage, galvanized finish, as made by AA Wire Products or comparable product by Dur-O-Wall Inc., or Heckman

2.5 FLASHINGS

- A. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
 1. Products: Subject to compliance with requirements, provide one of the following:

- a. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
 - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.
 - c. Hohmann & Barnard, Inc.; Textroflash.
 - B. Lap Sealant: Butyl type as specified in Section 079005.
- 2.6 ACCESSORIES
- A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Mortar Diverter: Panels designed for installation at flashing locations.
 - a. Manufacturers:
 - 1) Mortar Net USA, Ltd; Mortar Net with Insect Barrier: www.mortarnet.com.
 - 2) Substitutions: See Section 016000 - Product Requirements.
 - B. Nailing Strips: Softwood lumber, preservative treated; as specified in Section 061000.
 - C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- 2.7 MORTAR AND GROUT MIXES
- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Masonry below grade and in contact with earth: Type S.
 - 2. Exterior, non-loadbearing masonry: Type N.
 - 3. Interior, non-loadbearing masonry: Type O.
 - B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
 - C. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
 - D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
 - E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 - EXECUTION

- 3.1 EXAMINATION
- A. Verify that field conditions are acceptable and are ready to receive masonry.
 - B. Verify that related items provided under other sections are properly sized and located.
 - C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- 3.2 PREPARATION
- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
 - B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- 3.3 COLD AND HOT WEATHER REQUIREMENTS
- A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.
 - B. Cold-Weather Requirements:
 - 1. Protect masonry units from freezing weather and prevent accumulation of ice.
 - 2. Do not build on frozen substrates.
 - 3. Remove and replace unit masonry damaged by frost or by freezing conditions.
 - 4. Do not lay concrete masonry units when temperature of surrounding atmosphere is below 40 degrees F or is likely to fall below 40 degrees F in the 24 hour period after laying, unless adequate protection is provided.
 - 5. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 degrees F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

- 3.4 COURSING
- A. Establish lines, levels, and coursing indicated. Protect from displacement.
 - B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
 - C. Concrete Masonry Units:
 - 1. Bond: Running.
 - D. Brick Units:
 - E. Calcium Silicate Units:
 - 1. Bond: As indicated.
- 3.5 PLACING AND BONDING
- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
 - B. Lay hollow masonry units with face shell bedding on head and bed joints.
 - C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
 - D. Remove excess mortar and mortar smears as work progresses.
 - E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
 - F. Interlock intersections and external corners, except for units laid in stack bond.
 - G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
 - H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 - I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
 - J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
 - K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.
- 3.6 WEEPS/CAVITY VENTS
- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
- 3.7 CAVITY MORTAR CONTROL
- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
 - B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
- 3.8 REINFORCEMENT AND ANCHORAGE - GENERAL
- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
 - B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 - C. Place continuous joint reinforcement in first and second joint below top of walls.
 - D. Lap joint reinforcement ends minimum 6 inches.
 - E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.
- 3.9 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY
- A. Install horizontal joint reinforcement 8 inches on center.
 - B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 - C. Place continuous joint reinforcement in first and second joint below top of walls.
 - D. Lap joint reinforcement ends minimum 6 inches.
- 3.10 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
- A. Install horizontal joint reinforcement 16 inches on center.
 - B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 - C. Place continuous joint reinforcement in first and second joint below top of walls.
 - D. Lap joint reinforcement ends minimum 6 inches.
 - E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

- 3.11 MASONRY FLASHINGS
- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
 - B. Extend flashings to within 1/4 inch of exterior face of masonry.
 - C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.
- 3.12 GROUTED COMPONENTS
- A. Lap splices minimum 24 bar diameters.
 - B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
 - C. Place and consolidate grout fill without displacing reinforcing.
 - D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.
- 3.13 ENGINEERED MASONRY
- A. Lay masonry units with core cells vertically aligned clear of mortar and unobstructed.
 - B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before placing grout.
 - C. Reinforce masonry unit cores with reinforcement bars and grout.
 - D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03200.
 - E. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with course grout using high or low lift grouting techniques.
 - F. When grouting is stopped for more than 1 hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.
 - G. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation. Place subsequent lifts in 8 inch increments and rod for grout consolidation.
 - H. High Lift Grouting
 - 1. Provide cleanout opening no less than 4 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit.
 - 2. In double wythe walls, omit every second masonry unit in one of the wythes for clean out and cell inspection purposes.
 - 3. In double wythe walls, construct vertical grout barriers or dams between the masonry wythes, with masonry units every 30 feet maximum.
 - 4. Clean out masonry cells [and cavities] with high pressure water spray. Permit complete water drainage.
 - 5. Request the Owner's Representative to inspect the cells. Allow 3 days advance notice of inspection.
 - 6. After cleaning and cell inspection, seal openings with masonry units.
 - 7. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
 - 8. Limit grout lift to 48 inches and rod for grout consolidation. Wait 30 to 60 minutes before placing next lift.
- 3.14 CONTROL AND EXPANSION JOINTS
- A. Provide bond breaker at joints between clay brick, cast stone and CMU per NCMA Standards.
 - B. Do not continue horizontal joint reinforcement through control and expansion joints.
 - C. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
 - D. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
 - E. Size control joint in accordance with Section 079005 for sealant performance.
 - F. Form expansion joint as detailed.
- 3.15 TOLERANCES
- A. Maximum Variation from Alignment of Columns: 1/4 inch.
 - B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
 - C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
 - E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
 - F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
 - G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- 3.16 CUTTING AND FITTING
- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
 - B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.
- 3.17 FIELD QUALITY CONTROL
- A. An independent testing agency will perform field quality control tests, as specified in Section 014000.
 - B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.
 - C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.
- 3.18 CLEANING
- A. Remove excess mortar and mortar droppings.
 - B. Replace defective mortar. Match adjacent work.
 - C. Clean soiled surfaces with cleaning solution.
 - D. Use non-metallic tools in cleaning operations.
- 3.19 PROTECTION
- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 044510
STONE MASONRY VENEER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Limestone masonry veneer at fireplace cladding.
- B. Mortar and Grout.
- C. Reinforcement and Anchorage.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit four samples of stone to illustrate color, texture, and extremes of color range.

PART 2 PRODUCTS

2.1 STONE MASONRY

- A. Limestone Veneer: Meet ASTM C 568, Classification: II (Medium-Density).
 - 1. Face Size: Random rectangular.
 - 2. Acceptable Product: Refer to Finish Legend.

2.2 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91, Type N.
 - 1. Colored mortar: Premixed cement as required to match Architect's color sample.
- B. Mortar Aggregate: ASTM C144.
- C. Grout Aggregate: ASTM C404.
- D. Water: Clean and potable.
- E. Accelerating Admixture: Nonchloride type for use in cold weather.

2.3 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 - 1. Blok-Lok Limited : www.blok-lok.com.
 - 2. Hohmann & Barnard, Inc (including Dur-O-Wal brand) : www.h-b.com.
 - 3. WIRE-BOND: www.wirebond.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Masonry Veneer Anchors (for masonry 3 stories in height or less):
 - 1. Model No. AA311, 7/8" wide x 7" long minimum (masonry ledge depth plus 4"), corrugated sheet steel, 20 gage, galvanized finish, as made by AA Wire Products or comparable product by Dur-O- Wall Inc., or Heckman

2.4 ACCESSORIES

- A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.5 MORTAR MIXES

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Interior, non-loadbearing masonry: Type O.
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
- C. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
- D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.

- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- 3.2 PREPARATION
- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
 - B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- 3.3 COLD AND HOT WEATHER REQUIREMENTS
- A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.
- 3.4 COURSING
- A. Establish lines, levels, and coursing indicated. Protect from displacement.
 - B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
 - C. Provide coursing as selected by Architect.
- 3.5 PLACING AND BONDING
- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
 - B. Lay hollow masonry units with face shell bedding on head and bed joints.
 - C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
 - D. Remove excess mortar and mortar smears as work progresses.
 - E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
 - F. Interlock intersections and external corners, except for units laid in stack bond.
 - G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
 - H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 - I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- 3.6 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
- A. Install horizontal joint reinforcement 16 inches on center.
 - B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 - C. Place continuous joint reinforcement in first and second joint below top of walls.
 - D. Lap joint reinforcement ends minimum 6 inches.
 - E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- 3.7 TOLERANCES
- A. Maximum Variation from Alignment of Columns: 1/4 inch.
 - B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
 - C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
 - D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
 - E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
 - F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
 - G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- 3.8 CUTTING AND FITTING
- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
 - B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.
- 3.9 CLEANING
- A. Remove excess mortar and mortar droppings.
 - B. Replace defective mortar. Match adjacent work.
 - C. Clean soiled surfaces with cleaning solution.
 - D. Use non-metallic tools in cleaning operations.

3.10 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 055000

METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated steel items.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.3 QUALITY ASSURANCE

- A. Design under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B, black finish.
- E. Bolts, Nuts, and Washers: ASTM A325, Type 1, galvanized to ASTM A153 where connecting galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FABRICATED ITEMS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 1/2 x 2-1/2 inches members spaced at 20 inches.
 - 2. Rungs: 3/4 inch diameter solid round bar spaced 12 inches on center.
 - 3. Space rungs 5 inches from wall surface.
- B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- C. Juliette Balcony Railings: Tube and channel sections in sizes and configurations as indicated. Grind welds smooth. Prime for field painting.

2.4 FINISHES - STEEL

- A. Prime paint all steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete, items to be imbedded in masonry, and items exposed to the elements.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123 requirements.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 055100

METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Stairs with concrete treads.
- B. Structural steel stair framing and supports.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.3 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
- C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).

PART 2 PRODUCTS

2.1 METAL STAIRS - GENERAL

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports in conjunction with those supports designed by another Engineer, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
 - 1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
 - 2. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code in conjunction with those supports designed by another Engineer
 - 3. Dimensions: As indicated on drawings.
 - 4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
 - 5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
 - 6. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
 - 1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
 - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
 - b. Welds Exposed to View: Ground smooth and flush.
 - c. Mechanical Joints: Butted tight, flush, and hairline.
 - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
 - e. Exposed Edges and Corners: Eased to small uniform radius.
 - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.2 METAL STAIRS WITH CONCRETE TREADS

- A. Jointing and Finish Quality Level: Commercial, as defined above.
- B. Risers: Closed.
- C. Precast Concrete Treads:
 - 1. Concrete Strength: 5,000 psi at 28 days, minimum.
 - 2. Air Content: 4 to 6 percent.
 - 3. Cement Color: Natural gray.
 - 4. Concrete Reinforcement: As required to resist live loading.
 - 5. Concrete Finish: Broom.
- D. Risers: Same material and thickness as tread pans.
 - 1. Riser/Nosing Profile: Sloped riser with rounded nosing of minimum radius.
 - 2. Nosing Depth: Not more than 1-1/2 inch overhang.
 - 3. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.
- E. Stringers: Rolled steel channels, including those designed by another Engineer.
- F. Landings: Cast in place concrete, supported and reinforced as required to achieve design load capacity.
- G. Railings: Steel pipe railings.
- H. Finish: Shop- or factory-prime painted.

2.3 MATERIALS

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.
- C. Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 - 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- D. Concrete Fill: Portland cement Type I, 3000 psi 28 day strength, 2 to 3 inch slump.
- E. Steel Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.4 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
 - 1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
 - 2. Number of Coats: One.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. When field welding is required, clean and strip primed steel items to bare metal.

3.3 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

SECTION 055213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Stair railings and guardrails.
- C. Balcony railings and guardrails.

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.2 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
 - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
 - 3. For anchorage to stud walls, provide backing plates, for bolting anchors.
 - 4. Posts: Provide adjustable flanged brackets.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.3 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A 500, Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: No exposed bolts or screws.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.4 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 061000

ROUGH CARPENTRY - STRUCTURAL

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Lumber.
 - B. Plywood.
 - C. Preservative treatment.
 - D. Fasteners.
 - E. Related accessories.
- 1.3 SUBMITTALS
 - A. Submit items in accordance with Section 013000.
 - B. Product Data: Provide technical data on wood preservative and fire retardant treatment materials and application techniques/instructions.
 - C. Manufacturers Certificates: Certify that products meet or exceed specified requirements.
- 1.4 QUALITY ASSURANCE
 - A. Lumber Grading: Lumber Grading Rules and Wood Species in accordance with Voluntary Product Standards. Grading rules of following associations apply to materials furnished.
 - 1. Southern Pine Inspection Bureau (SPIB).
 - 2. West Coast Lumber Inspection Bureau (WCLIBB).
 - 3. Western Wood Products Association (WWPA).
 - B. Grade Marks: Identify lumber and plywood by official grade mark on each piece.
 - 1. Lumber: Include symbol of grading agency, mill name, grade, species, grading rules and condition of seasoning at time of manufacturer.
 - 2. Plywood: Include type, class identification index, and agency mark.
 - C. Requirements of Regulatory Agencies
 - 1. Preservative and Pressure Treated Lumber and Plywood: Comply with American Wood Preservers Bureau Standards.
- 1.5 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products without damage in accordance with Section 016000.
 - B. Store products above ground, on platforms or skids, and covered with appropriate coverings. Provide for adequate air circulation.
 - C. Do not store seasoned materials in damp or wet locations.
 - D. Support products in such a way as to prevent warping and distortion.

PART 2 - PRODUCTS

- 2.1 MATERIALS
 - A. General:
 - 1. Where stress rating values are given in lieu of grades, select any quality which will meet structural requirements, but as approved by Architect and Owner.
 - 2. Comply with the following:
 - a. "Product Use Manual" as published by the Western Wood Products Association for selection and use of products.
 - b. "Plywood Specification and Grade Guide" as published by the American Plywood Association.
 - c. "Standard Specifications for Grades of California Redwood Lumber" published by the Redwood Inspection Bureau.

- B. Lumber
 - 1. Grading rules: PS 20.
 - 2. Dimensions: Lumber dimensions are nominal except for posts and timbers; actual dimensions conform to industry standards established by the American Lumber Standards Committee and applicable rules writing agencies. Provide sizes as detailed.
 - 3. Moisture content: 19 percent maximum moisture content after treatments for fire retardant and preservative treated woods.
 - 4. Surfacing: Surface four sides (S4S), unless noted otherwise.
 - 5. Species: As noted below and on drawings.
 - 6. Uses, grades, and stress ratings:
 - a. Studs, joists, beams, headers: Refer to Drawings.
 - 7. At decorative beams, joists, and rafter tails, utilize appearance grade rough sawn cedar unless indicated otherwise by Architect.
- C. Plywood
 - 1. Grading rules: PS 1, using group 1-4 species as required for rating.
 - 2. Exposures: Provide exposure ratings as indicated.
 - 3. Thickness: As detailed or noted, or otherwise as required to maintain span capability.
 - 4. Uses, Grades, Ratings
 - a. Roof Sheathing: C-D/Exposure 1-APA Rated Sheathing, minimum 19/32" thick (or as otherwise indicated on structural drawings). Provide with foil faced radiant barrier on attic side of sheathing.
 - b. Wall Sheathing: C-D/Exposure 1-APA Rated Sheathing, minimum 19/32" thick (or as otherwise indicated on structural drawings). OSB (with no added urea formaldehyde) may be substituted, provided it meets span rating of plywood and is approved by structural engineer and Architect.
 - c. Subflooring: C-D/Exposure 1-APA Rated Sheathing 23/32" minimum thickness (or as otherwise indicated on structural drawings), tongue and grooved edges, plywood. OSB (with no added urea formaldehyde) may be substituted, provided it meets span rating of plywood and is approved by structural engineer and Architect.
- D. Gypsum Sheathing:
 - 1. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) CertainTeed Corporation; GlasRoc.
 - 2) G-P Gypsum Corporation; Dens-Glass Gold.
 - 3) Temple-Inland Inc.; GreenGlass
 - 4) United States Gypsum Co.; Secureck.
 - b. Type and Thickness: Type X, 1/2 inch thick.
 - c. Size: 48 by 108 inches.
- E. Fasteners
 - 1. Provide fasteners in sizes, spacings, and locations to suit applications and as indicated on the Drawings. Galvanize for all exterior applications unless noted otherwise.
 - 2. Bolts: FS FF-B-575, FF-B-584 or ASTM A307.
 - 3. Nuts: FS FF-N-836.
 - 4. Expansion shields, lag screws, and bolts: FS FF-B-561.
 - 5. Toggle bolts: FS FF-B-588.
 - 6. Wood screws: FS FF-S-111.
 - 7. Nails and staples: FS FF-N-105. Provide only common wire nails or spikes of the sizes as shown on the nailing schedule, except where otherwise indicated on the Drawings or as otherwise required by codes.
 - 8. Metal nailing discs
 - a. Flat caps, minimum 1 inch diameter.
 - b. Minimum 30 gage sheet metal.
 - c. Formed to prevent dishing.
 - d. Bell or cup shapes not acceptable.
 - 9. Joists hangers: Zinc-coated steel, size as indicated on the Drawings.
 - 10. Metal cross bridging: 16 gage, zinc coated steel; nailable type with two holes in each end or compression type with prongs at each end.
 - 11. Ply-clips: Extruded 6063-T6 aluminum alloy.
 - 12. Spikes: Galvanized, size as required.
 - 13. Wood column base anchors: As indicated on Drawings.
- F. Adhesives: Waterproof, air cured type, cartridge dispenses, of strength to suit application.

- G. Composite Glue Laminated Members: Parallam units by Weyerhaeuser Wood Products, or approved equal, may be used as headers and beams if approved by Structural Engineer. Refer to Drawings for locations and other information.

2.2 WOOD TREATMENTS (SHOP PREPARED)

- A. Preservative Treated Wood (Pressure Impregnated)
 - 1. Preservative treat sill plates and grounds in contact with concrete, roof curbs, cants and nailers for flashing, and elsewhere as noted or shown.
 - 2. Use waterborne salt preservatives as follows: AWPB LP-2 above ground; AWPB LP 22 ground contact. Redry lumber to maximum 19 percent moisture content, stamp with AWPB "Dry". Redry plywood and particleboard to 15 percent maximum moisture content.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify General Contractor of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

3.2 INSTALLATION

- A. General
 - 1. Discard units of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.
 - 2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Scribe and cope as required.
 - 3. Securely attach carpentry work to substrates by anchoring and fastening as required by codes, the Drawings, as indicated herein, and as otherwise required to draw members into place and securely hold same unless otherwise indicated. Use washers under all bolt heads and nuts.
 - 4. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
 - 5. Make tight connections between members (except plywood) to develop full strength of members.
 - 6. Install fasteners without splitting of wood. If wood is split, replace damaged member.
 - 7. Pre-drill as necessary.
 - 8. Comply with APA E30a requirements for plywood unless more stringent requirements for nailing are indicated on the Drawings.
 - 9. Install fastener types and at spacings recommended by National Design Specifications for Stress Grade Lumber and Its Fastening - 2005 for lumber and APA Guide E30e for Plywood, unless more restrictive code requirements dictate tighter spacing or heavier fasteners, or unless otherwise indicated herein or on the Drawings.
 - 10. Locate members as indicated on the drawings. Size, spacing or spans shall not be changed without specific approval of Architect and Owner. Take care to place proper grades and species of members where indicated in accordance with the lumber schedule herein.
 - 11. Temporary brace framing at the end of each days' work until all framing is completed and securely anchored. Leave temporary bracing in place as long as required for safety. As work progresses, securely connect work to compensate for dead load, wind and erection stresses. Do not use shims for levelling under wood or metal bearing points.
 - 12. Comply with the "Manual of House Framing" published by the National Lumber Manufacturer's Association as a minimum standard of quality for workmanship.
 - 13. Bolting:
 - a. Drill holes 1/16" larger in diameter than the bolts being used.
 - b. Drill holes straight and true from one side only.
 - c. Do not bear bolt threads on wood; use washers under heads where they bear on wood and under all nuts.
- B. Wood Grounds, Nailers, and Blocking
 - 1. Provide where required for attachment of other work, including, but not limited to:
 - a. Edges of siding not terminating on a structural member.
 - b. Handrailing attachments.
 - c. HVAC unit and duct terminations in walls and ceilings.
 - d. Base and wall cabinets.
 - e. Toilet accessories (especially grab bars and medicine cabinets).
 - f. Window covering attachments.

- g. Where plates do not form a firestop at each ceiling floor level and attic.
 - h. On steel members for gypsum board, gypsum sheathing, and plywood attachment.
 - i. Attic scuttle holes.
 - 2. Form to shapes cut as necessary for true line and level of work to be attached.
 - 3. Coordinate location with other work involved.
 - 4. Attach to substrates to support applied loading. At blocking between joists and rafters, toenail each side, each end with 2-8d nails or splice through using 2-16d nails.
 - 5. Provide permanent grounds of dressed, preservative treated, key beveled lumber not less than 1/2 inch wide, and of thickness required to bring face of ground to exact thickness of finish material involved.
- C. Wood Furring
- 1. Install plumb and level with closure strips at edges and openings.
 - 2. Shim with wood as required for tolerance of finished work.
- D. Joists
- 1. Install with crown edge up.
 - 2. Support ends of each member minimum of 3 inch bearing on wood and metal.
 - 3. Do not notch in middle third of joist span.
 - 4. Do not exceed 1/6 of depth of member for depth of notches in top or bottom of joists.
 - 5. Limit end notches to total of 1/3 depth of member.
 - 6. Do not bore holes closer than 2 inches from top or bottom of joist.
 - 7. Limit bore holes diameter to 1/3 depth of member.
 - 8. Frame openings with headers and trimmers; double headers and trimmers where span of header exceeds 6 feet, or as otherwise noted on the Drawings.
 - 9. Lap members framing from opposite directions of beams, girders or partitions not less than 4 inches. Provide solid blocking over supports.
 - 10. Provide bridging between joists where nominal depth-to-thickness ratio exceeds four. Use bevel cut 1 x 4 inch or 2 x 3 inch members, or solid wood members full depth of joist, or pre-manufactured steel bridging. Refer to structural drawings for locations other than mid-span.
 - 11. At all joist and truss bearing locations, toe nail each side as indicated on Drawings.
- E. Plywood Roof and Wall Sheathing
- 1. Install with long edge perpendicular to framing.
 - 2. Allow 1/8 inch open space between panel ends and edges for expansion and contraction.
 - 3. Place ends over framing members. Install over two or more spans with end joints staggered and face grain perpendicular to supports.
 - 4. Secure with galvanized nails to each support spacing fasteners at 12 inch o.c. for intermediate supports and 6 inch o.c. for ends supports (or at spacing as otherwise indicated on structural drawings), using 8d ring shank nails. Staples will be allowed as a substitution if allowed by governing codes, Architect, and Owner.
 - 5. Use edge clips at all unsupported edges at roof sheathing, spaced at 12" maximum on center.
- F. Plywood Floor Sheathing:
- 1. Plywood
 - a. Install tongue and groove panels with joints between panels staggered over center of supports.
 - b. Allow 1/8 inch open space between panel ends and edges for expansion and contraction.
 - c. Install over two or more supports and with end joints staggered and face grain perpendicular to supports.
 - d. Glue with APA approved adhesive and nail to supports 3/8" from edge, using 8d ring shank nails.
- G. Stud Framing
- 1. Plates and stud members
 - a. Provide single or double plates at locations indicated. Cut bottom plates at upper floor door openings to allow continuous pour of lightweight concrete.
 - b. Stud spacing: As indicated on Drawings.
 - c. Provide studs in continuous lengths without splices.
 - d. End nail in bottom plate and end nail to lower top plate.
 - e. Overlap double top plates minimum of 32 inches except at outside corners where overlap shall be 3-1/2 inches.
 - f. Face nail upper top plate to lower top plate.
 - g. Nail bottom plate to wood construction.
 - h. Anchor bottom plate to concrete structure with anchor bolts, lag bolts, or power driven studs, spaced as required to resist lateral forces as established by building code and as determined by Architect and Owner. Provide a minimum two anchors per piece.

- i. Triple studs at corners and partitions intersections.
 - j. Anchor studs abutting masonry or concrete with 1/2 inch anchor bolts, maximum spacing of 2 feet o.c.
 - k. Partitions parallel with joists: Locate joists directly below studs.
 - l. Openings must be square, plumb, and level.
 - 2. Headers
 - a. Continuous headers, same width as studs, depth required to span widest opening. Provide solid bearing. No shimming allowed.
 - b. Toenail headers to studs and opening framing.
 - c. Stagger joints in individual header members minimum of three stud spaces, allowing no joints to occur over openings.
 - d. Refer to structural drawings for additional information.
 - 3. Blocking
 - a. Wedge, align, and anchor blocking with countersunk bolts, washers and nuts, or nails.
 - b. Locate blocking to facilitate installation of finishing materials, fixtures, specialty items, and trim.
 - 4. Place two beads of non-hardening sealant continuous under exterior and unit demising framed walls on cementitious foundations. Refer to Section 07900 for material and installation.
 - 5. Stud framing nailing schedule: Refer to Drawings.
 - H. Posts or Columns
 - 1. Provide two surfaces on posts at right angles to each other for installation of interior finish materials.
 - 2. Erect posts straight, plumb with straight edge and level, and brace with tack boards at plate and sill.
 - 3. Provide specified metal anchor and attachment devices.
 - I. Rafters
 - 1. Notch to fit exterior wall plates and toenail to plates.
 - 2. Double rafters at opening in roof framing to provide headers and trimmer, and support with metal hangers.
 - 3. At ridge, place rafters directly opposite each other and nail to ridge member or support with metal hangers.
 - 4. At valleys and hips, provide rafters of size as shown, or if not, rafters twice as thick as regular rafters and 2 inches deeper. Bevel edge of jack rafters for full contact bearing against valley rafter.
 - 5. Provide collar ties as shown, and if not, use 1 x 6 inch boards between every third pair of rafters, located below ridge member, 1/3 of distance to ceiling joists.
 - 6. At all rafter bearings, toe nail each side with 3-8d nails.
 - J. Beams and Girders
 - 1. Install with crown edge up.
 - 2. Provide minimum 3-1/2 inch bearing (unless indicated otherwise to be greater dimension) at ends of each member. Tie together ends where jointed over supports if discontinuous.
 - 3. Nail built-up beams or girders with two rows of 20d nails spaced maximum of 12" o.c., locating one row near top edge and other near bottom edge of member.
 - 4. Where members frame into pockets of masonry or concrete walls, allow 1/2 inch air space around all sides and end.
 - 5. At built-up beams, fasten together with one - 3/4" diameter bolt top and bottom at each end and 1/2" diameter bolt at 24" o.c. staggered top and bottom.
- 3.3 TOLERANCES
- A. Framing members: 1/4 inch maximum from true position.
 - B. Surface flatness of floors/roofs: 1/4 inch in 10 feet maximum.
- 3.4 PROTECTION
- A. Protect products from moisture absorption and subsequent warping or deterioration until subsequent construction can proceed.

END OF SECTION

SECTION 061100

ARCHITECTURAL ROUGH CARPENTRY

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Exterior wood trim material.
 - B. Fasteners.
 - C. Related accessories.
- 1.3 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products without damage in accordance with Section 016000.
 - B. Store products above ground, on platforms or skids, and covered with appropriate coverings. Provide for adequate air circulation.
 - C. Do not store seasoned materials in damp or wet locations.
 - D. Support products in such a way as to prevent warping and distortion.

PART 2 - PRODUCTS

- 2.1 MATERIALS
 - A. Lumber
 - 1. Grading rules: PS 20.
 - 2. Dimensions: Lumber dimensions are nominal except for posts and timbers; actual dimensions conform to industry standards established by the American Lumber Standards Committee and applicable rules writing agencies. Provide sizes as detailed.
 - 3. Moisture content: 19% maximum moisture content after treatments for fire retardant and preservative treated woods.
 - 4. Surfacing: Surface four sides (S4S), unless noted otherwise.
 - 5. Species: Southern Yellow Pine or West Coast Douglas Fir, unless noted otherwise.
 - 6. Uses, grades, and stress ratings:
 - 7. Exterior wood trim, fascia boards: Species: Spruce-Pine-Fir (SPF) and Hem Fir (HF), pre-finished as made by:
 - a. Realtrim by Woodtone.
 - b. Armor Coat Recon by Belco Forest Products.
 - B. Fasteners
 - 1. Provide fasteners in sizes, spacings, and locations to suit applications and as indicated on the Drawings. Galvanize for all exterior applications unless noted otherwise.
 - 2. Bolts: FS FF-B-575, FF-B-584 or ASTM A307.
 - 3. Nuts: FS FF-N-836.
 - 4. Expansion shields, lag screws, and bolts: FS FF-B-561.
 - 5. Toggle bolts: FS FF-B-588.
 - 6. Wood screws: FS FF-S-111.
 - 7. Nails and staples: FS FF-N-105. Provide only common wire nails or spikes of the sizes as shown on the nailing schedule, except where otherwise indicated on the Drawings or as otherwise required by codes.
 - C. Adhesives: Waterproof, air cured type, cartridge dispenses, of strength to suit application.
- 2.2 WOOD TREATMENTS (SHOP PREPARED)
 - A. Preservative Treated Wood (Pressure Impregnated)
 - 1. Preservative treat sill plates and grounds in contact with concrete, roof curbs, cants and nailers for flashing, and elsewhere as noted or shown.
 - 2. Use waterborne salt preservatives as follows: AWPB LP-2 above ground; AWPB LP 22 ground contact. Redry lumber to maximum 19% moisture content, stamp with AWPB "Dry". Redry plywood and particleboard to 15% maximum moisture content.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify Contractor of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

3.2 INSTALLATION

A. General

1. Discard units of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.
2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Scribe and cope as required.
3. Securely attach carpentry work to substrates by anchoring and fastening as required by codes, the Drawings, as indicated herein, and as otherwise required to draw members into place and securely hold same unless otherwise indicated. Use washers under all bolt heads and nuts.
4. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
5. Make tight connections between members (except plywood) to develop full strength of members.
6. Install fasteners without splitting of wood. If wood is split, replace damaged member.
7. Pre-drill as necessary.
8. Comply with APA E30a requirements for plywood unless more stringent requirements for nailing are indicated on the Drawings.
9. Install fastener types and at spacings recommended by NFPA National Design Specifications for Stress Grade Lumber and Its Fastening - 1973 for lumber and APA Guide E30e for Plywood, unless more restrictive code requirements dictate tighter spacing or heavier fasteners, or unless otherwise indicated herein or on the Drawings.
10. Locate members as indicated on the drawings. Size, spacing or spans shall not be changed without specific approval of Architect. Take care to place proper grades and species of members where indicated in accordance with the lumber schedule herein.

3.3 TOLERANCES

- A. Framing members: 1/4 inch maximum from true position.
- B. Surface flatness of floors/roofs: 1/4 inch in 10 feet maximum.

3.4 PROTECTION

- A. Protect products from moisture absorption and subsequent warping or deterioration until subsequent construction can proceed.

END OF SECTION

SECTION 061120

COMPOSITE WOOD RAILINGS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within General and Supplementary Conditions of the Contract, Division 01 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Composite wood railings.
 - B. Fasteners.
 - C. Related accessories.
- 1.3 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products without damage in accordance with Section 012500.
 - B. Store products above ground, on platforms or skids, and covered with appropriate coverings. Provide for adequate air circulation.
 - C. Do not store seasoned materials in damp or wet locations.
 - D. Support products in such a way as to prevent warping and distortion.
- 1.4 SUBMITTALS
 - A. General: Submit in accordance with Section 013000.
 - B. Product Data:
 - 1. Submit product data indicating physical properties and performance criteria for molded materials and related components.
 - C. Shop Drawings: Submit shop drawings indicating materials, dimensions, full size details, jointing methods, anchorages, and attachment provisions.
 - D. Submit following Informational Submittals:
 - 1. Certifications specified in Quality Assurance article.
 - 2. Qualification Data: Fabricator's and installer's qualification data.

PART 2 - PRODUCTS

- 2.1 MATERIALS
 - A. Composite Lumber:
 - 1. Description: Manufactured composite material consisting of approximately 50% wood fibers and 50% thermoplastic polymer material.
 - 2. Dimensions: Lumber dimensions are nominal; Provide sizes as detailed.
 - 3. Moisture content: 19% maximum moisture content after treatments for fire retardant and preservative treated woods.
 - 4. Acceptable Product: Trex Wood Polymer Composite Lumber, by Trex Company, Winchester, VA.
 - B. Fasteners
 - 1. Provide fasteners in sizes, spacings, and locations to suit applications and as indicated on the Drawings. Use either galvanize or stainless steel for all fasteners.
 - 2. Bolts: FS FF-B-575, FF-B-584 or ASTM A307.
 - 3. Nuts: FS FF-N-836.
 - 4. Expansion shields, lag screws, and bolts: FS FF-B-561.
 - 5. Toggle bolts: FS FF-B-588.
 - 6. Screws: FS FF-S-111.
 - 7. Note: Fastening by nailing is not acceptable. Fasten railing to substructure only with only with cadmium plated or fluoropolymer coated course wood screws.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify General Contractor of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

3.2 INSTALLATION

A. General

1. Discard units of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.
2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Scribe and cope as required.
3. Securely attach carpentry work to substrates by anchoring and fastening as required by codes, the Drawings, as indicated herein, and as otherwise required to draw members into place and securely hold same unless otherwise indicated. Use washers under all bolt heads and nuts.
4. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
5. Make tight connections between members (except plywood) to develop full strength of members.
6. Install fasteners without splitting of wood. If wood is split, replace damaged member.
7. Pre-drill as necessary.
8. Comply with APA E30a requirements for plywood unless more stringent requirements for nailing are indicated on the Drawings.
9. Install fastener types and at spacings recommended by NFPA National Design Specifications for Stress Grade Lumber and Its Fastening - 1973 for lumber and APA Guide E30e for Plywood, unless more restrictive code requirements dictate tighter spacing or heavier fasteners, or unless otherwise indicated herein or on the Drawings.
10. Locate members as indicated on the drawings. Size, spacing or spans shall not be changed without specific approval of Architect and Owner. Take care to place proper grades and species of members where indicated in accordance with the lumber schedule herein.
11. Bolting:
 - a. Drill holes 1/16" larger in diameter than the bolts being used.
 - b. Drill holes straight and true from one side only.
 - c. Do not bear bolt threads on wood; use washers under heads where they bear on wood and under all nuts.

3.3 TOLERANCES

- A. Framing members: 1/4 inch maximum from true position.
- B. Surface flatness of floors/roofs: 1/4 inch in 10 feet maximum.

3.4 PROTECTION

- A. Protect products from moisture absorption and subsequent warping or deterioration until subsequent construction can proceed.

END OF SECTION

SECTION 061750

PLATE CONNECTED WOOD TRUSSES

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- A. Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
- A. Prefabricated wood trusses for roof and floor framing.
 - B. Bridging, bracing, and anchorage.
- 1.3 SYSTEM DESCRIPTION
- A. Refer to Drawings and governing codes for live and dead load requirements.
- 1.4 QUALITY ASSURANCE
- A. Manufacturer: Company specializing in manufacture of prefabricated wood trusses with 3 years minimum experience.
 - B. Design trusses under direct supervision of Professional Engineer experienced in structural framing design of trusses registered in state where project is located. Truss designs shall bear the name, seal, and registration number of the licensed professional engineer who supervised the truss structural framing design. Comply with the "National Design Specifications for Stress Graded Lumber and Its Fastenings" as published by N.F.P.A. and "Design Specifications for Light Metal Plate Connected Wood Trusses" as published by T.P.I.
 - C. Lumber Grading Agency: Certified by ALSC.
 - D. Truss Plates: In accordance with Truss Plate Institute.
- 1.5 REGULATORY REQUIREMENTS
- A. Conform to applicable code for loads, seismic zoning, wind strapping, and other governing load criteria.
 - B. Conform to applicable code for fire retardant requirements.
 - C. Conform to UL requirements to achieve rating indicated.
- 1.6 SUBMITTALS
- A. Submit shop drawings and product data under provisions of Section 01330.
 - B. Indicate framing system, truss placement, sizes and spacing of members, loads and cambers, bearing and anchor location and loads, bridging and bracing, connecting plates, and framed openings. Submit design calculations. Also submit:
 1. Design and fabrication data.
 2. Name of manufacturer, sizes, and gages of metal connectors. Must be ICBO approved.
 3. Lumber specifications.
 4. Design loads, including plan of truss layout showing locations and weights of all roof mounted or truss supported equipment coordinated with mechanical and electrical contractors, and allowable unit stress increases, if any.
 5. Pitch, span, and spacing of trusses.
 6. Force analysis or bar forces in each member.
 7. Size and location of all connector plates.
 8. Truss supports.
 9. Camber, if any.
 10. Permanent bracing and bridging.
 11. Handling and erection details and instructions.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Deliver products to site under provisions of Section 016000.
 - B. Store and protect products under provisions of Section 016000.
 - C. Transport and store trusses according to Truss Plate Institute publication HIB-91.
 - D. Protect trusses from warpage and distortion during transit and when stored.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Member of T.P.I. and having minimum experience level indicated.

2.2 MATERIALS

- A. Lumber Grading Rules: NFPA. Identify each piece by grade mark of lumber inspection bureau or agency approved by American Lumber Standards Committee board.
- B. Steel Connectors: Truss Plate Institute standard ANSI/ASTM A 446 steel, Grade A; galvanized; die stamped with integral teeth; yield strength of 33,000 psi; minimum ultimate tensile strength of 48,000 psi.
- C. Fasteners: Galvanized; size and type to suit condition.
- D. Bearing Plate Anchors: Bolts or ballistic fasteners for anchorages to steel.
- E. Wood Blocking: Softwood lumber, fir species, construction grade, maximum moisture content of 19 percent.

2.3 FABRICATION

- A. Verify dimensions and site conditions prior to fabrication.
- B. Cut members accurately to length, angle, and true to line to achieve properly fit, tight joint connections.
- C. Jig trusses during fabrication to assure accurate configuration.
- D. Build camber into truss.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that supports and openings are ready to receive trusses.
- B. Verify sufficient end bearing area.
- C. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Coordinate placement of bearing items.

3.3 INSTALLATION

- A. Install trusses in accordance with manufacturer's instructions, at spacings as indicated on Drawings and approved shop drawings. The load carrying capacity of any one truss shall not be exceeded during the construction period.
- B. Place trusses true to line and level in correct location.
- C. Provide temporary bracing to hold trusses in place until permanently secured.
- D. Place permanent bridging, bracing, and anchors to maintain trusses straight and in correct position before inducing loads.
- E. Do not field cut or alter trusses.
- F. Place headers and supports to frame openings required.
- G. Frame openings between trusses with lumber in accordance with Section 061000.
- H. Coordinate placement of sheathing with work of this Section.

3.4 TOLERANCES

- A. Framing Members: 1/2 inch maximum from true position.

END OF SECTION

SECTION 062000

FINISH CARPENTRY

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Finish carpentry items.
 - B. Wood casings and moldings.
 - C. Hardware and attachment accessories.
- 1.2 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements for submittal procedures.
 - B. Product Data:
 - C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.
- 1.3 QUALITY ASSURANCE
 - A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade at clubhouse and Economy grade elsewhere.
 - B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Protect work from moisture damage.
- 1.5 PROJECT CONDITIONS
 - A. Sequence the installation to ensure utility connections are achieved in an orderly and expeditious manner.
 - B. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

PART 2 - PRODUCTS

- 2.1 LUMBER MATERIALS
 - A. Softwood Lumber: Southern Pine species, plain sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
 - B. Hardwood Lumber: Refer to Finish Legend for species, and cut, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
- 2.2 SHEET MATERIALS
 - A. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application.
 - B. Softwood Plywood Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B; glue type as recommended for application.
 - C. Hardwood Plywood: Face species as indicated in Finish Legend, cut as indicated, book matched, medium density fiberboard core; glue type as recommended for application.
 - D. Softwood Plywood: PS 1 Grade A-B; Veneer core; Southern Pine face species, plain sliced cut.
 - E. Particleboard: ANSI A208.1; composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
- 2.3 FASTENERS
 - A. Fasteners: Of size and type to suit application; brushed chrome finish in exposed locations.
- 2.4 ACCESSORIES
 - A. Lumber for Shimming, Blocking: Softwood lumber of Southern Pine species.
 - B. Primer: Alkyd primer sealer.
 - C. Wood Filler: Solvent base, tinted to match surface finish color.

- 2.5 FABRICATION
- A. Shop assemble work for delivery to site, permitting passage through building openings.
 - B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
 - C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- 2.6 SHOP FINISHING
- A. Sand work smooth and set exposed nails and screws.
 - B. Apply wood filler in exposed nail and screw indentations.
 - C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
 - D. Finish work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Section 1500:
 - 1. Transparent: Conversion varnish (formerly TR-4).

PART 3 - EXECUTION

- 3.1 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.
- 3.2 INSTALLATION
- A. Set and secure materials and components in place, plumb and level.
 - B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- 3.3 TOLERANCES
- A. Maximum Variation from True Position: 1/16 inch.
 - B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.
- 3.4 SCHEDULE
- A. Interior of Units:
 - 1. Window Sills: 5-1/4 inches wide hard wood with bullnose edge, prepare for paint finish.
 - 2. Crown Moldings: MDF.
 - 3. Bases, Casings, and Miscellaneous Trim: 2-1/4 inch finger jointed pine; prepare for paint finish.
 - 4. Aprons: 2-1/4 inch finger jointed pine.
 - 5. Chair rail in exterior corridors: Finger jointed pine; profile as indicated.
 - 6. 1x4 stained hardwood for frame around mirrors in bathroom.
 - B. Interior of Clubhouse:
 - 1. Stained grade hardwood, in profiles as indicated for base, crown, chair rails.

END OF SECTION

SECTION 068200
GLASS FIBER REINFORCED PLASTIC

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass fiber reinforced, resin fabrications for use in janitor closets.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified component products.
- C. Samples: Submit two, 12 x 12 inch in size, illustrating color, texture, and finish.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable code for a flame/smoke rating of 25/450 in accordance with UL requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect components from damage by retaining shipping protection in place until installation.

1.5 FIELD CONDITIONS

- A. Do not install site-fabricated components when site conditions may be detrimental to successful installation.
- B. Maintain temperature and humidity conditions favorable to proper curing of resin during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Glass Fiber and Resin Fabrications:
 - 1. Fiberglass Specialties, Inc : www.fiberglassspecialties.com.
 - 2. Fibertech Corp : www.fibertech.net.
 - 3. Marlite: www.marlite.com.
 - 4. Nudo Products, Inc.: www.nudo.com.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.2 MATERIALS

- A. Fabric Reinforcement: Glass fiber woven fabric, manufacturer's standard thickness.
- B. Roving: Continuous glass fiber strands, chemically sized, wound into tubeless packaging, for up to 24 percent chopped glass content, for epoxy resin.
- C. Mat: Chopped fine glass fiber strand, sized into mat form, 9.5 oz/sq yd, for polyester resin gel coat backup.
- D. Resin: Polyester type, fire resistant, high workability characteristics , integral coloring additives.
- E. Polishing Cream: Compatible gel coat polishing cream to restore gloss surface finish.

2.3 SHOP FABRICATION

- A. Mold Material: Metal type.
- B. Mold Surface: Textured.
- C. Fabricate components with the open mold hand lay-up method.
- D. Finish other surfaces not in contact with the mold to match the molded surfaces in appearance.
- E. Finish trim corners and edges.

2.4 FINISH

- A. Color: White, or as scheduled.
- B. Exposed to view Surface Texture: As scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work and dimensions are as instructed by the fabricator.

3.2 INSTALLATION

- A. Install fabrications in accordance with shop drawings and fabricator's instructions.

3.3 TOLERANCES

- A. Maximum variation from true position: 1/4 inch.
- B. Maximum offset from true alignment: 1/8 inch.

3.4 CLEANING

- A. Clean components of foreign material without damaging finished surface.
- B. Hand rub smooth surfaces with polishing cream.
- C. Clean fabrications in accordance with fabricator's instructions.

3.5 PROTECTION

- A. Place protective structural covering over installed units.

END OF SECTION

SECTION 071300
SHEET WATERPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sheet membrane waterproofing for use at:
 - 1. Occupied areas of building where earth occurs on opposite side of wall.
 - 2. Beneath concrete topping slabs at balconies, breezeways, and stairway access corridors.
 - 3. Elsewhere as indicated on Drawings.

1.2 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with three years experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience.
- D. Conduct a preconstruction meeting with the subcontractor to review submittals, products, and details as well as provisions for an in-place mockup to review installation process and detailing

1.3 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.4 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water , except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

2.1 WATERPROOFING APPLICATIONS

- A. Self-Adhered Modified Bituminous Sheet Waterproofing.

2.2 MEMBRANE MATERIALS

- A. Self-Adhered Modified Bituminous Membrane:
 - 1. Thickness: 60 mil (0.060 inch).
 - 2. Tensile Strength:
 - a. Film: 5000 pounds per square inch, minimum, measured according to ASTM D882 and at grip-separation rate of 2 inches per minute.
 - b. Membrane: 325 pounds per square inch, minimum, measured according to ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.
 - 3. Elongation at Break: 300 percent, minimum, measured according to ASTM D412.
 - 4. Water Vapor Permeance: 0.05 perm, maximum, measured in accordance with ASTM E96/E96M.
 - 5. Low Temperature Flexibility: Unaffected when tested according to ASTM D1970 at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
 - 6. Peel Strength: 9 pounds per inch, minimum, when tested according to ASTM D903.
 - 7. Lap Adhesion Strength: 4 pounds per inch, minimum, when tested according to ASTM D1876.
 - 8. Puncture Resistance: 50 pounds, minimum, measured in accordance with ASTM E154.
 - 9. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
 - 10. Hydrostatic Resistance: Resists the weight of 200 feet when tested according to ASTM D5385.
 - 11. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
 - 12. Manufacturers:
 - a. Grace Construction Products ; Product Bituthene 3000: www.na.graceconstruction.com.
 - b. American Hydrotech, Inc; VM75.
 - c. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860/861.

- d. CETCO Building Materials Group, a subsidiary of AMCOL International Corp; Envirosheet.
- e. Henry Company; Blueskin WP 100/200.
- f. Meadows, W.R.,Inc; SealTight Mel-Rol.

2.3 ACCESSORIES

- A. Flexible Flashings: Type recommended by membrane manufacturer.
- B. Drainage Mat/Protection Board: Type as recommended by manufacturer for application to promote drainage and protect waterproofing from damage during concrete placement.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions. Vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- D. Seal cracks and joints with sealant using depth to width ratio as recommended by sealant manufacturer.
- E. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.
- F. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate according to ASTM D5295.
 - 1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
 - 2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in the reference standard.
 - 3. Remove and replace areas of defective concrete as specified in Section 033000.
 - 4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in the referenced standard.
 - 5. Test concrete surfaces as described in the referenced standards. Verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.3 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions.
- B. Roll out membrane. Minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.
- D. Overlap edges and ends and seal by method recommended by manufacturer, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- F. Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.
- G. Install flexible flashings. Seal items penetrating through membrane with flexible flashings. Seal watertight to membrane.
- H. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.
- I. Install protection board in accordance with manufacturer's recommendations.

3.4 FIELD QUALITY CONTROL

- A. On completion of horizontal membrane installation, dam installation area in preparation for flood testing.
- B. Flood to minimum depth of 1 inch with clean water. After 48 hours, inspect for leaks.
- C. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by Architect; repeat flood test. Repair damage to building.
- D. When area is proven watertight, drain water and remove dam.

3.5 PROTECTION

- A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 072100
THERMAL INSULATION

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Batt insulation in exterior wall and ceiling construction.
- 1.2 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
 - C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
 - D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- 1.3 FIELD CONDITIONS
 - A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Insulation:
 - 1. Owens Corning.
 - 2. Certainteed.
 - 3. USG.
 - 4. Johns Manville.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- 2.2 APPLICATIONS
 - A. Insulation in Wood Framed Walls: Batt insulation with no vapor retarder at acoustical applications and kraft faced vapor retarder at exterior envelope.
- 2.3 BATT INSULATION MATERIALS
 - A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136 , except for facing, if any.
 - 4. Formaldehyde Content: Zero.
 - 5. Thermal Resistance: As indicated on Drawings, but not less than
 - a. R-38 at attics (or blown-in insulation per section 072126)
 - b. R-30 at ceilings over un-conditioned areas and below hard surfaced floors.
 - c. R-13 at exterior walls
 - d. R-11 for acoustical applications at party walls.
 - 6. Facing:
 - a. Unfaced at acoustical applications.
 - b. With reinforced kraft facing at wood studs at exterior walls and ceilings.
 - 7. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville Corporation: www.jm.com.
 - c. Knauf Insulation GmbH: www.knaufinsulation.us.
 - d. Owens Corning Corp: www.owenscorning.com.
 - 8. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof 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. Coordinate work of this section with construction of air barrier seal specified in Section 072500.

3.3 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 072126
BLOWN INSULATION

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Loose insulation pneumatically placed and poured into joist spaces through access holes.
- 1.2 SYSTEM DESCRIPTION
 - A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements, in conjunction with Section 072100.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on product characteristics, performance criteria, limitations .
 - C. Manufacturer's Installation Instructions: Indicate procedure for preparation and installation.
 - D. Certificates: Certify that products of this section meet or exceed specified requirements.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Blown Insulation:
 - 1. CertainTeed Corporation : www.certainteed.com.
 - 2. GreenFiber : www.greenfiber.com
 - 3. Johns Manville Corporation : www.jm.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- 2.2 MATERIALS
 - A. Loose Fill Insulation: Provide one of the following:
 - 1. ASTM C739, cellulose fiber type, nodulated for pour and bulk for pneumatic placement.
 - 2. ASTM C 764, glass fiber type, nodulated for pour and bulk for pneumatic placement.
 - B. Thermal Conductivity: 0.27 BTU in/(hr sq ft deg F).
 - C. Installed Thickness: As indicated on drawings, but not less than R-38 in attic spaces.
 - D. Ventilation Baffles: Formed plastic.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.
 - B. Verify that light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.
 - C. Verify spaces are unobstructed to allow placement of insulation.
- 3.2 INSTALLATION
 - A. Install insulation and ventilation baffle in accordance with ASTM C1015 and manufacturer's instructions.
 - B. Place insulation pneumatically to completely fill stud, joist, and rafter spaces .
 - C. Place insulation against baffles. Do not impede natural attic ventilation to soffit.
 - D. Place against and behind mechanical and electrical services within the plane of insulation.
 - E. Completely fill intended spaces. Leave no gaps or voids.
 - F. Repair and reseal insulation access ports. Refinish to match disturbed work.

END OF SECTION

SECTION 072500

WEATHER BARRIERS - SHEET

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Water Resistive Barriers: Materials to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.
- 1.2 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on material characteristics.
 - C. Manufacturer's Installation Instructions: Indicate preparation.
- 1.3 FIELD CONDITIONS
 - A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
- 1.4 WARRANTY
 - A. Provide manufacturer's standard 10 year water-tightness warranty covering material and installation.

PART 2 - PRODUCTS

- 2.1 WATER RESISTIVE BARRIER
 - A. Air Barrier Sheet, Mechanically Fastened:
 - 1. Air Penetration: 0.001 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677. ≤0.04 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2357.
 - 2. Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B.
 - 3. Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127.
 - 4. Basis Weight: Minimum 2.7 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 - 5. Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460.
 - 6. Tensile Strength: Minimum 38/35 lbs/in., when tested in accordance with ASTM D882, Method A.
 - 7. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
 - 8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 10, Smoke Developed: 10.
 - 9. Manufacturers:
 - a. DuPont Tyvek; www.dupont.com.
 - b. Pactiv Corporation; greenguard.pactiv.com.
 - c. VaproShield, LLC; www.vaproshield.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
 - 10. Acceptable Products:
 - a. Behind Portland Cement Plaster:
 - 1) Tyvek D Commercial Wrap.
 - b. Self-Adhering Flexible flashing tape, DuPont™ FlexWrap™. and Self Adhering Straight flashing tape, DuPont™ StraightFlash™.
- 2.2 SEALANTS
 - A. Sealant: Membrane manufacturer's standard compatible components.
- 2.3 ACCESSORIES
 - A. Self-Adhesive Sheet Flashing: Membrane manufacturers standard compatible components.
 - B. Thinners and Cleaners: As recommended by material manufacturer.
 - C. Attachment Devices: Galvanized steel nails with weather resistant plastic caps.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this section.

3.2 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.3 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Water-Resistive/Air Barriers: Install continuous barrier over surfaces indicated, with sheets lapped to shed water and seams sealed.
- C. Mechanically Fastened Sheets - On Exterior:
 - 1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
 - 2. Overlap seams as recommended by manufacturer but at least 6 inches.
 - 3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
 - 4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
 - 5. For applications specified to be air-tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
 - 6. Install air barrier UNDER jamb flashings.
 - 7. Install head flashings under weather barrier.
 - 8. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.
- D. Openings and Penetrations in Exterior Weather Barriers:
 - 1. Install self-adhesive 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 self-adhesive flashing 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 self-adhesive flashing at least 9 inches wide, covering entire depth of framing.
 - 4. At head of openings, install self-adhesive 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 self-adhesive flashing around penetrating item and seal to weather barrier surface.

3.4 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.
- C. Provide inspections as required by weather barrier manufacturer as required to secure warranty indicated.

3.5 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 073110
ASPHALT SHINGLES

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established in General and Supplementary Conditions of the Contract, Division 01 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Asphalt shingle roofing with moisture shedding underlayment, eaves, valley, and ridge protection, and associated protective flashings.
- 1.3 SUBMITTALS
 - A. Submit shop drawings of metal flashings and product data under provisions of Section 013000.
 - B. Indicate general construction, configurations, jointing methods and locations, fastening methods and locations, and installation details.
 - C. Submit manufacturer's installation instructions under provisions of Section 013000.
- 1.4 QUALITY ASSURANCE
 - A. Industry Standards:
 - 1. Work to conform to Asphalt Roofing Manufacturers Association (ARMA) Residential Asphalt Roofing Manual.
- 1.5 WARRANTY
 - A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
 - 2. Material Warranty Period: 50 years from date of Substantial Completion, prorated, with first five years non-prorated.
 - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 80 mph (110 mph in coastal areas) for 50 years from date of Substantial Completion.
 - 4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 50 years from date of Substantial Completion.
 - B. Special Project Warranty: Roofing Installer's Warranty, or warranty form at end of this Section, signed by roofing Installer, covering the 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 specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- 1.6 PROJECT CONDITIONS
 - A. Proceed with shingle installation only when existing and forecasted weather will allow work to be performed according to manufacturer's recommendations and warranty requirements, and when deck is completely dry.

PART 2 - PRODUCTS

- 2.1 ROOFING MATERIALS
 - A. Asphalt Shingles:
 - 1. Fiberglass base, architectural grade, mineral granule surfaced type; Class A, minimum 240 pounds per square; self-sealing. Specific product and color as selected by Architect. Provide color as selected by Architect.
 - 2. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following:
 - a. GAF/Elk Roofing Products.
 - b. Certainteed.
 - c. Tamko.

- B. Underlayment: No. 30 lb un-perforated asphalt saturated felts as recommended for use in construction of built-up roofs, meeting ASTM D226.
- C. Elastomeric Underlayment (at valleys, hips, ridges): Rubberized asphaltic sheet laminated to a polypropylene film, 40 mil minimum total thickness, 36 inch width, equal to Ice and Water Shield by W.R. Grace. Provide with appropriate primers as recommended by manufacturer.
- D. Fasteners: Standard round wire shingle type nails of hot-dipped zinc-coated steel; minimum 13/64 inch head diameter and 0.080 inch shank diameter; of sufficient length to penetrate through roof sheathing. Staples may be used if appropriate size and pattern used as approved by Owner.
- E. Plastic Cement: Cutback asphaltic type with mineral fiber components, as recommended for sealing and coating flashings in buildings; free of toxic solvents; capable of setting within 24 hours at temperatures of approximately 75 degrees F and 50 percent RH.
- F. Lap Cement: Fibrated cutback asphaltic type, as recommended for use as an adhesive in the cold application of asphalt roofing or underlayment; free of toxic solvents.
- G. Shingle Over Vent: Refer to Section 077210.

2.2 FLASHING MATERIALS

- A. Sheet Flashings: Refer to section 076200.
- B. Bituminous Paint: Acid and alkali resistant type; black color.
- C. Nails: Standard round wire roofing type of hot-dipped zinc-coated steel; minimum 19/64 inch head diameter and 0.104 inch shank diameter; of sufficient length to penetrate through roof sheathing.

2.3 FLASHING FABRICATION

- A. Form flashings to profiles indicated on Drawings, and to protect roof assembly and shed water. Form sections square, true, and accurate to profile, in maximum possible lengths, free from distortion and other defects detrimental to appearance or performance.
- B. Hem exposed edges of flashings minimum 1/4 inch on underside.
- C. Apply bituminous paint on concealed surfaces of flashings if required to prevent electrolysis.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install asphalt shingle roofing over dry surfaces, free of ridges, warps, and voids.
- B. Coordinate installation of roof mounted components or work projecting through roof. Verify roof openings are framed, sized, and located prior to installing work of this Section.
- C. Completed installation to provide weathertight service.
- D. Comply with NRCA and roofing manufacturer's recommendations, and applicable code requirements for installation.

3.2 EAVES PROTECTION INSTALLATION

- A. Place eave edge drip flashing tight with fascia boards. Weather lap joints 2 inches. Secure deck flange with nails.
- B. Starting from eave edge, lay 36 inch wide strip of underlayment to produce a one ply membrane. Weather lap plies minimum 19 inches and nail in place. Lap ends minimum 6 inches. Stagger end joints of each consecutive ply.
- C. In climates where ice dams are likely to form in winter months, place a layer of elastomeric underlayment in lieu of felt underlayment in accordance with manufacturer's recommendations. Extend from the eave edge to a point at least 24 inches beyond the inside wall.

3.3 PROTECTIVE UNDERLAYMENT INSTALLATION

- A. Place 1-ply of underlayment over area not protected by eave membrane with ends and edges weatherlapped minimum 6 inches. Stagger end laps of each consecutive layer. Nail protective underlayment to hold in place.
- B. Install protective underlayment perpendicular to slope of roof.
- C. Weather lap underlayment minimum 4 inches over eaves membrane.
- D. Weather lap and seal items projecting through or mounted on roof with plastic cement.

3.4 VALLEY PROTECTION INSTALLATION

- A. Place 1 layer of rubberized asphalt valley flashing, minimum 36 inches wide, centered over closed valleys. Weather lap joints minimum 6 inches.
- B. Lace composition shingles in valleys over valley flashing in a woven, interlaced pattern per applicable industry or association standards, unless open valley is shown on Drawings.

3.5 FLASHING INSTALLATION

- A. Weather lap joints minimum 2 inches in weathertight manner. Secure in place with nails, spaced at manufacturer's recommended intervals, but not greater than 12 inches on center. Conceal fastenings.
- B. Flash and seal work projecting through roofing with sealant. Provide weathertight installation.

3.6 ASPHALT SHINGLES INSTALLATION

- A. Place asphalt shingles in straight coursing pattern with 5-5/8 inch weather exposure to produce triple thickness over entire roof area.
- B. Provide triple course of shingles at eaves. Project first course of shingles 3/4 inch beyond face of fascia boards.
- C. Extend shingles a minimum of 1/2 inch beyond face of gable edge fascia boards.
- D. Nail shingles in place in accordance with manufacturer's instructions.
- E. Install ridge vents in accordance with manufacturer's recommendations.
- F. Cap hips and ridges with individual shingles, maintaining 5-5/8 inch weather exposure. Place to avoid exposed nails. Coordinate with ridge vent installation if ridge vents are indicated.

END OF SECTION

SECTION 074113
METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Standing-seam metal roofs and canopies including flashings and accessories over solid sheathing.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Design metal roof panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. FMG Listing: Provide metal roof panels and component materials that comply with requirements in FMG 4471 as part of a panel roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. Fire/Windstorm Classification: Class 1A-90.
 - 2. Hail Resistance: SH.
- D. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592-95:
 - 1. Design Wind Loads: As indicated on structural drawings or as otherwise determined using design wind loads applicable to Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure." Include wind uplift calculations for open canopies.
 - 2. Deflection Limits: Metal roof panel assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/240 of the span.
- E. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
- C. Samples for Initial Selection: For each type of metal roof panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- D. Warranties: Samples of special warranties.
- E. Provide sealed shop drawings including fastener and clip type, size, and spacing to demonstrate system is capable of resisting specified wind uplift.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

- 1.6 PROJECT CONDITIONS
- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
 - B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.
- 1.7 COORDINATION
- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
 - B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, purlins and rafters, parapets, walls, and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.
- 1.8 WARRANTY
- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Twenty years from date of Substantial Completion.
 - B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
 - C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Weathertight Warranty Period: 20 years (NDL) from date of Substantial Completion.

PART 2 - PRODUCTS

- 2.1 PANEL MATERIALS
- A. Metallic-Coated Steel Sheet: 24 gauge (minimum) G-90 (ASTM-A525) Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
 - a. Color: As selected by Architect from manufacturer's full range.
 - B. Panel Sealants:
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.
- 2.2 MISCELLANEOUS METAL FRAMING
- A. Miscellaneous Metal Framing, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z120) hot-dip galvanized or coating with equivalent corrosion resistance unless otherwise indicated.
 - B. Stainless Steel Fasteners for Miscellaneous Metal Framing: Of type, size, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

- 2.3 MISCELLANEOUS MATERIALS
- A. Stainless Steel Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.
- 2.4 STANDING-SEAM METAL ROOF PANELS
- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
- B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and snapping panels together.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - a. MBCI; a division of NCI Building Systems, L. P.
 - b. Architectural Building Components Houston, Texas
 - c. Petersen Aluminum Corporation.
 2. Clips: Floating to accommodate thermal movement.
 - a. Material: 0.025-inch min thick, stainless-steel sheet.
 3. Panel Coverage: 16-18 inches
 4. Panel Height: 1.5 to 1.75 inches.
- 2.5 UNDERLAYMENT MATERIALS
- A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
 3. Products: Subject to compliance with requirements, provide one of the following
 - a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
 - b. Grace Construction Products; a unit of Grace, W. R. & Co.; Ice and Water Shield HT.
 - c. Henry Company; Blueskin PE200 HT.
- 2.6 ACCESSORIES
- A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
 2. Closure Strips: Closed-cell, expanded, cellular, rubber or cross-linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or pre-molded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Formed from same material as roof panels, pre-painted with coil coating, minimum 0.018 inch thick. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fascia, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.
- 2.7 FABRICATION
- A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weathertight and minimize noise from movements within panel assembly.

- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. End Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. End Seams for Other Than Aluminum: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 4. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 6. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.
- 2.8 FINISHES
- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
- C. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 1. Install beneath entire roof surface.
- B. Install flashings to cover underlayment to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

3.4 METAL ROOF PANEL INSTALLATION, GENERAL

- A. Take special precautions in handling and installing bare metal panels so that finish is not defaced or marred. Utilize tennis shoes, cloth gloves, and other apparel and precautions as recommended by metal manufacturer.
- B. Any and all penetrations are to be located outside reveals.
- C. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

- D. Thermal Movement. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
 - 1. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- E. Install metal roof panels as follows:
 - 1. Commence metal roof panel installation and install minimum of 300 sq. ft. in presence of factory-authorized representative.
 - 2. Field cutting of metal panels by torch is not permitted.
 - 3. Install panels perpendicular to purlins.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Provide metal closures at rake edges rake walls and each side of ridge and hip caps.
 - 6. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
 - 7. End Splices: Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
 - 8. Install metal flashing to allow moisture to run over and off metal roof panels.
- F. Fasteners:
 - 1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and stainless-steel fasteners for surfaces exposed to the interior.
- G. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- H. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.
 - 1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

3.6 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal roof panel assembly including but not limited to trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet 3 m with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures per manufacturer's requirements.

END OF SECTION

SECTION 074646

FIBER CEMENT SIDING AND SOFFITS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Wood-fiber cement siding, soffits, and trim.
- 1.2 SUBMITTALS
- A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: 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. Warranty: Submit copy of manufacturer's warranty, made out in Owner's name, showing that it has been registered with manufacturer.
- 1.3 QUALITY ASSURANCE
- A. Installer Qualifications: Company specializing in performing work of the type specified in this section with minimum 3 years of experience.
- 1.4 DELIVERY, STORAGE, AND HANDLING
- A. Store products under waterproof cover and elevated above grade, on a flat surface.

PART 2 - PRODUCTS

- 2.1 PRODUCTS
- A. Acceptable Manufacturers:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. James Hardie Building Products, Inc: www.jameshardie.com.
 - 3. Nichiha USA, Inc: www.nichiha.com
 - 4. Cemplank; cemplank.com
 - B. Fiber Reinforced Cement Lap Siding: Individual horizontal 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. Vertical Pattern (Board and Batten): 48-inch-wide sheets with wood-grain texture and grooves 8 inches wide in beaded-edge style.
 - 2. Thickness: 5/16 inch, nominal.
 - 3. Finish: Factory applied primer.
 - 4. Warranty: 50 year limited; transferable.
 - C. Fiber Reinforced Cement Sheet Siding: Cement fiber reinforced lap siding, finish as selected by Architect; 4 x 8 x 5/16 inch thick; having the following ASTM E 84 fire test performance: Flame Spread 0, Fuel Contribution 0, Smoke Development 5.
 - 1. Acceptable Products:
 - a. Hardipanel by James Hardie Building Products.
 - D. Fiber Reinforced Cement Soffit Panels: Panels 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. Texture: Simulated cedar grain.
 - 2. Length: 96 inches, nominal.
 - 3. Width: 48 inches.
 - 4. Thickness: 5/16 inch, nominal.
 - 5. Finish: Factory applied primer.
 - 6. Manufacturer: Same as siding.
 - 7. Perforations: None.

2.2 ACCESSORIES

- A. Trim: Same material and texture as siding and soffit, dimensions as indicated on Drawings.
 - 1. Acceptable Products:
 - a. HardiTrim by James Hardie Building Products.
 - b. HardiTrim Batten by James Hardie Building Products.
- B. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch.
- C. Joint Sealer: As specified in Section 079005.
- D. Finish Paint: Latex house paint acceptable to siding manufacturer; primer recommended by paint manufacturer.
- E. Furring Strips For Use Behind Sheet Siding: 3/8 inch thick x 1-1/2 inch wide polypropylene furring strips, attached vertically over air/moisture barrier at face of each supporting stud, to create capillary break between face of air/moisture barrier and back of siding, equal to Cor-A-Vent Sturdi-Strip with SV-3 continuous at top and bottom, by Cor-A-Vent Inc.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine substrate and 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 the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Install sheet metal flashing:
 - 1. Above door and window trim and casings.
 - 2. Above horizontal trim in field of siding.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
 - 1. Read warranty and comply with all terms necessary to maintain warranty coverage.
 - 2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
 - 3. Use trim details indicated on drawings.
 - 4. Touch up all field-cut edges before installing.
 - 5. Pre-drill nail holes if necessary to prevent breakage.
- B. Over Wood and Gypsum or Wood-Composite Sheathing: Fasten siding through sheathing into studs.
- C. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant.
- D. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
- E. 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.
- F. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.
- G. Finish Painting: Specified in Section 099000.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 076200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Fabricated sheet metal items, including flashings, counterflashings, and other items indicated in Schedule.
 - B. Reglets and accessories.
- 1.2 ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Convene one week before starting work of this section.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- 1.4 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 three years of documented experience.
- 1.5 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 that could cause discoloration or staining.
- 1.6 WARRANTY
 - A. Provide two year water tightness warranty against leaks through sheet metal flashing and at terminations.

PART 2 PRODUCTS

- 2.1 SHEET MATERIALS
 - A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 - B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M) ; 0.032 inch thick; plain finish shop pre-coated with modified silicone coating.
 - 1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
 - 2. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
 - 3. Color: To match approved sample.
- 2.2 ACCESSORIES
 - A. Fasteners: Galvanized steel , with soft neoprene washers.
 - B. Underlayment: ASTM D226, organic roofing felt, Type I ("No. 15").
 - C. Primer: Zinc chromate type.
 - D. Protective Backing Paint: Zinc molybdate alkyd.
 - E. Sealant: Type S-GP specified in Section 079005.
 - F. Plastic Cement: ASTM D4586, Type I.
 - G. Reglets: Surface mounted type, galvanized steel .

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

PART 3 EXECUTION

3.1 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.

3.2 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.

3.3 INSTALLATION

- A. Conform to drawing details.
- B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight.

3.4 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULE

- A. Counterflashings at Roofing Terminations (over roofing base flashings).
- B. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches.
- C. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports.
- D. Scupper and Downspouts.
- E. Gutters and Downspouts.

END OF SECTION

SECTION 076210
FLEXIBLE FLASHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Formed Products: Concealed flashing within wall assemblies where indicated or otherwise where required to protect and shed incidental water to the exterior.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Flashing and trim assemblies as indicated shall withstand structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store flashing materials in contact with other materials that might cause staining, denting, or other surface damage. Store flashing materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 FLEXIBLE FLASHING

- A. Self-Adhesive flexible flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 40 mils.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Advanced Building Products Inc.; Strip-N-Flash.
 - b. Carlisle Coatings & Waterproofing; CCW-705 Air & Vapor Barrier Strips.
 - c. Grace Construction Products; Perm-A-Barrier Detail Membrane.
 - d. Henry; Blueskin SA

2.2 HIGH TEMPERATURE FLASHING

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
 - 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
 - b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.
 - d. Owens Corning; WeatherLock Metal High Temperature Underlayment.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, separators, sealants, and other miscellaneous items as required for complete metal flashing installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FLASHING INSTALLATION

- A. General: Install as indicated on Drawings and per Manufacturer's recommendations.
- B. Self-Adhering Sheet Flashing: Install self-adhering sheet flashing, wrinkle free. Apply primer if required by flashing manufacturer. Comply with temperature restrictions of flashing manufacturer for installation. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover flashing with subsequent construction within 14 days.
- C. Location:
 - 1. Flexible Flashing: As indicated on drawings, or at all exterior windows, doors or other penetrations where high temperature flashing is not required.
 - 2. High Temperature Flashing: As indicated on drawings, or at all locations where flashing will be in contact with metal coping or metal panels where high temperatures exist.

END OF SECTION

SECTION 077100
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manufactured roof specialties, including copings.
- B. Roof control and expansion joint covers.

1.2 RELATED REQUIREMENTS

- A. Section 077200 - Roof Accessories: Manufactured curbs, roof hatches.
- B. Section 079005 - Joint Sealers.

1.3 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels, 2010.
- B. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association, 2003.
- C. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; Single Ply Roofing Industry, 2003. (ANSI/SPRI ES-1)

1.4 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Samples: Submit two appropriately sized samples of coping and expansion joint cover.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual details.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Copings:
 - 1. Architectural Products Co: www.archprod.com.
 - 2. W.P. Hickman Company: www.wph.com.
 - 3. Metal-Era Inc: www.metalera.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.2 COMPONENTS

- A. Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners.
 - 2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-3 to positive and negative design wind pressure as defined by applicable code.
 - 3. Material: Formed steel sheet, galvanized, 24 gage, 0.024 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: To be selected by Architect from manufacturer's standard range.
- B. Control and Expansion Joint Covers: Composite construction of flexible TPO flashing of white color with closed cell urethane foam backing, each edge seamed to aluminum sheet metal flanges, designed for nominal joint width of 1 inch. Include special formed corners, tees, intersections, and wall flashings, each sealed watertight.

2.3 ACCESSORIES

- A. Sealant: As specified in Section 079005

2.4 FINISHES

- A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions.
- B. Conform to SMACNA Architectural Sheet Metal Manual drawing details as noted:
- C. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- D. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- E. Coordinate installation of flashing flanges into reglets.

END OF SECTION

SECTION 077210

ROOF ACCESSORIES – STEEP SLOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Provisions established in General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.

1.2 SECTION INCLUDES

- A. Roof and soffit ventilators.

1.3 SUBMITTALS

- A. General: Submit following items under provisions of Section 013000.
- B. Product Data: Indicating performance and physical characteristics of roof ridge ventilators and accessories proposed for use.
- C. Color Charts: Manufacturer's standard pre-finished product charts showing actual physical coating.
- D. Manufacturer's Instructions: Printed manufacturer's installation instructions.
- E. Warranty: Two copies of watertightness warranty, and finish coating warranty on pre-finished products.
- F. Submit samples under provisions of Section 013000.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in roofing work with 3 years minimum experience in similar sized installations.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle, and protect products under provisions of Section 016000.
- B. Stack pre-formed material to prevent twisting, bending, and abrasions, and to provide ventilation.
- C. Prevent contact with materials which may cause discoloration or staining.
- D. Ship pre-coated products with strippable covering.

1.6 WARRANTY

- A. Provide warranties under provisions of Section 017800.
- B. Provide 2 year watertightness guarantee beginning at substantial completion including repair or replacement of defective materials and workmanship.

PART 2 - PRODUCTS

2.1 LOW PROFILE ROOF VENT (provide where indicated)

- A. Galvanized, low profile.
- B. Small;
 - 1. Net Free Area: 51 square inches, minimum.
 - 2. Acceptable Product: RVA-51 by Air Vent Inc.

2.2 CONTINUOUS SOFFIT VENTS

- A. Continuous Soffits Vents:
 - 1. 2 inch wide by 8 feet long, bi-directional aluminum louvers.
 - 2. Acceptable Product: SA Series Aluminum Soffit-Strip as manufactured by

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, free from distortion and defects, to profiles indicated in accordance with SMACNA Architectural Sheet Metal Manual.
- B. Form pieces in longest practical lengths.
- C. Hem exposed flashings on underside 1/2 inch; miter and seam corners.
- D. Form materials which are typically concealed from view by the public with lap seams.
- E. Fabricate corners from one place with minimum 18 inch long legs; solder for rigidity or seal with sealant if approved by Owner.
- F. Fabricate vertical faces with bottom edge formed outward 1/8 inch and hemmed to form drip.
- G. Fabricate flashings to allow toe to extend minimum 2 inches over wall surfaces.
- H. Fabricate as much as possible in shop with machinery to eliminate as much hand tooling on the job as possible. Shop fabricate to allow for adjustments in the field for proper anchoring and joining.

2.4 ACCESSORIES

- A. Fasteners
 - 1. Nails: AISI Series 300 for stainless and galvanized steel; aluminum for aluminum sheets. Use annular ring shank type, No. 12 gage or larger to suit application, of sufficient length to penetrate backing material at least 7/8 inch.
 - 2. Screws and Bolts: AISI Series 300 for stainless and galvanized steel; and aluminum for aluminum sheets; of sufficient size and length to sustain imposed stresses.
- B. Protective Back Paint: Zinc chromate alkyd.
- C. Sealants: One component polyurethane, non-sagging, sealant as specified in Section 079000.
- D. Plastic Cement: FS SS-C-153, Bituminous plastic cement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify General Contractor of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

3.2 PREPARATION

- A. Field measure site conditions prior to fabricating work.

3.3 INSTALLATION

- A. Install using skilled workmen in accordance with manufacturer's printed instruction and recommendations.
- B. Conform to drawing details included in manuals published by AA and NRCA.
- C. Provide electrolytic separation between dissimilar metals with protective back paint.
- D. On soldered metal joints, make watertight for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

3.4 CLEANING

- A. Perform final cleaning under provisions of Section 017800.

3.5 PROTECTION

- A. Protect finished installation under provisions of Section 015000.

END OF SECTION

SECTION 078400

FIRESTOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Certificate from authority having jurisdiction indicating approval of materials used.
- G. Qualification statements for installing mechanics.

1.3 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
 - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:
 - a. With minimum 3 years documented experience installing work of this type.
 - b. Able to show at least 5 satisfactorily completed projects of comparable size and type.
 - c. Licensed by authority having jurisdiction.

1.4 MOCK-UP

- A. Install one firestopping assembly representative of each fire rating design required on project.
 - 1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
- B. If accepted, mock-up will represent minimum standard for the Work.
- C. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.5 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.1 FIRESTOPPING - GENERAL REQUIREMENTS

- A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.2 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.

2.3 MATERIALS

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
 - 1. Manufacturers:
 - a. A/DFire Protection Systems Inc: www.adfire.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 016000 - Product Requirements.
- C. Foam Firestopping: Single component silicone foam compound.
 - 1. Manufacturers:
 - a. 3M Fire Protection Products: www.3m.com/firestop.
 - b. Hilti, Inc: www.us.hilti.com.
 - c. Specified Technologies, Inc: www.stifirestop.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
- D. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers.
 - 1. Manufacturers:
 - a. A/DFire Protection Systems Inc: www.adfire.com.
 - b. USG: www.usg.com.
 - c. Substitutions: See Section 016000 - Product Requirements.
- E. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening.
 - 1. Manufacturers:
 - a. A/DFire Protection Systems Inc: www.adfire.com.
 - b. Pecora Corporation: www.pecora.com.
 - c. Thermafiber, Inc: www.thermafiber.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
- F. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed.
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 016000 - Product Requirements.
- G. Intumescent Putty: Compound that expands on exposure to surface heat gain.
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 016000 - Product Requirements.
- H. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration.
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. Hilti, Inc: www.us.hilti.com.
 - c. Nelson FireStop Products: www.nelsonfirestop.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 016000 - Product Requirements.
- I. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labeling required by code.

3.4 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 079005

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Pre-compressed foam sealers.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with other sections referencing this section.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit one sample for each Designation and color of joint sealant required. Samples shall be installed in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Compatibility and Adhesion Test Reports: Submit reports from joint sealant manufacturer indicating:
 - 1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.
- C. Do not apply sealants if ambient or substrate temperatures are below 40 degrees and rising.
- D. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than [eight] [Insert number] pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.5 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.6 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective workmanship within a five year period after Date of Substantial Completion.
- C. Correct defective materials for 5 years for urethane sealants and 20 years for silicone sealants.
- D. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Silicone Sealants:
 - 1. Bostik Inc: www.bostik-us.com.
 - 2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.

3. Pecora Corporation: www.pecora.com.
 4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 5. Tremco Global Sealants: www.tremcosealants.com.
 6. Substitutions: See Section 016000 - Product Requirements.
- B. Polyurethane Sealants:
1. Bostik Inc: www.bostik-us.com.
 2. Pecora Corporation: www.pecora.com.
 3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 4. Substitutions: See Section 016000 - Product Requirements.
- C. Acrylic Sealants (ASTM C920):
1. Tremco Global Sealants: www.tremcosealants.com.
 2. Substitutions: See Section 016000 - Product Requirements.
- D. Acrylic Emulsion Latex Sealants:
1. Bostik Inc: www.bostik-us.com.
 2. Pecora Corporation: www.pecora.com.
 3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 4. Tremco Global Sealants: www.tremcosealants.com.
 5. Substitutions: See Section 016000 - Product Requirements.
- E. Preformed Compressible Foam Sealers:
1. EMSEAL Joint Systems, Ltd: www.emseal.com.
 2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
 3. Dayton Superior Corporation: www.daytonsuperior.com.
 4. Tremco Global Sealants: www.tremcosealants.com.
 5. Substitutions: See Section 016000 - Product Requirements.

2.2 SEALANTS

- A. Type AL-A - Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
1. Product: BA-98 manufactured by Pecora.
- B. Type AL - Acrylic Sealant: ASTM C 920, Grade NS, Class 12-1/2, Uses NT, M, A, O; single component, solvent curing, non-staining, non-bleeding, non-sagging.
1. Color: Standard colors matching finished surfaces.
 2. Product: Sonolac manufactured by Sonneborn.
 3. Movement Capability: Plus and minus 12-1/2 percent.
 4. Service Temperature Range: -13 to 180 degrees F.
 5. Shore A Hardness Range: 25 to 50.
 6. Applications: Use for:
- C. Type U-MC – Non-sag Polyurethane Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, I, M, A, G, O; single component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type.
1. Color: Standard colors matching finished surfaces.
 2. Product: NP-2 manufactured by Sonneborn.
 3. Movement Capability: Plus and minus 25 percent.
 4. Service Temperature Range: -40 to 180 degrees F.
 5. Shore A Hardness Range: 20 to 35.
- D. Type U-SL - Self-Leveling Polyurethane Sealant: ASTM C 920, Grade P, Class 25, Uses T, I, M, A, O; single component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, self-leveling type.
1. Color: Color as selected.
 2. Product: SL-2 manufactured by Sonneborn.
 3. Movement Capability: Plus and minus 25 percent.
 4. Service Temperature Range: -40 to 180 degrees F.
 5. Shore A Hardness Range: 20 to 35.
- E. Type S-GP - Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, A, G, M, O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
1. Color: Standard colors matching finished surfaces.
 2. Product: 795 manufactured by Dow Corning.
 3. Movement Capability: Plus and minus 25 percent.
 4. Service Temperature Range: -65 to 180 degrees F.
 5. Shore A Hardness Range: 15 to 35.
- F. Type S-S - Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NG, A, G, M, O; single component, non-sagging, non-staining, sanitary.

1. Color: Standard colors matching finished surfaces.
 2. Product: 786 manufactured by Dow Corning.
 3. Service Temperature Range: -65 to 180 degrees F.
 4. Shore A Hardness Range: 15 to 35.
- G. Pre-Formed Elastomeric Foam Seal (PF): Protectowrap Triple Guard energy Sill Sealer.

2.3 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, bi-cellular cell PVC; oversized 30 to 50 percent larger than joint width .
- C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 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.

3.3 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. Tool joints concave.
- I. Pre-compressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

- A. Clean adjacent soiled surfaces.

3.5 PROTECTION

- A. Protect sealants until cured.

3.6 SCHEDULE

- A. Exterior Joints for Which No Other Sealant Type is Indicated: Type S-GP.
- B. Control and Expansion Joints in Paving: Type U-SL.
- C. Interior Wall Expansion Joints: Type U-NS.
- D. Exterior Wall Expansion Joints: Type S-GP.
- E. Joints Between Concrete Panels and Between Panels and Adjacent Work: Type S-SP.
- F. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type S-GP.
- G. Lap Joints in Exterior Sheet Metal Work: Type S-GP.
- H. Joints Between Exterior Metal Frames and Adjacent Work: Type S-GP.
- I. Under Exterior Door Thresholds: Type G-GP.
- J. Interior Joints for Which No Other Sealant is Indicated: Type AL.
- K. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type U-SL.
- L. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type S-S.
- M. In STC-Rated Walls, Between Metal Stud Track/Runner and Adjacent Construction: Type AL-A.

N. Beneath Exterior Stud Walls at Foundations: Type PF.
END OF SECTION

SECTION 081413

PREASSEMBLED WOOD DOOR AND FRAME UNITS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Stile and rail solid wood doors.
 - B. Solid core wood doors.
 - C. Hollow core doors.
 - D. Wood frames and hardware.
- 1.2 SUBMITTALS
- A. Submit in accordance with Section 013000.
 - B. Provide product data indicating door core materials and construction, veneer species, type and characteristics.
 - C. Provide shop drawings showing each door type in elevation and section, including hardware reinforcement locations.
- 1.3 QUALITY ASSURANCE
- A. Perform work in accordance with AWI Quality Standard Section 9, custom grade at clubhouse and economy grade elsewhere.
- 1.4 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, protect, and handle products to site under provisions of Sections 016000.
 - B. Package, deliver, store, and protect doors in accordance with AWI Section 1300. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on-site to permit ventilation.
 - C. Store doors as recommended by manufacturer.
- 1.5 COORDINATION
- A. Coordinate the work with door opening construction, door frame and door hardware installation.
- 1.6 WARRANTY
- A. Provide warranty under provisions of Section 017800 to the following term:
 - 1. Interior Doors: Two (2) years.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
- A. Weyerhaeuser Company.
 - B. Crown Doors.
 - C. Masonite Corporation.
 - D. Substitutions: Under provisions of Section 016000.
- 2.2 DOOR TYPES
- A. Stile and Rail Doors (at clubhouse): AWI Section 1400, 1-3/4 inches thick; solid lumber construction; AWI Custom quality; Alder species wood, for opaque finish. Provide fully tempered clear glazing for all lights.
 - B. Hollow Core Doors: AWI Section 1300, ANSI A135.4, Class 2 - Standard, Type S2S hardboard, 1/8 inch face thickness; 1-3/8 inch total thickness; paint finish.
 - 1. Type SHC - Standard; interior grade; Type II adhesive; panel design as scheduled on Drawings.
 - C. Solid Core Doors: AWI Section 1300, type PC - (particleboard core); flush design, with masonite hardboard face at opaque finish doors and stained hardwood of species and cut as selected by Architect where indicated.
 - D. Provide all doors pre-hung in opaque grade wood frame with casing to match adjacent base.
- 2.3 ACCESSORIES
- A. Facing Adhesive: Type II - water resistant for interior; Type I - waterproof for exterior.
 - B. Glazing Stops: Wood of same species as door facing.

2.4 FABRICATION

- A. Fabricate doors in accordance with AWI Custom Quality Standards requirements.
- B. Vertical Exposed Edge of Stiles: Of same species as veneer facing for wood doors.
- C. Fit door edge trim to edge of stiles after applying veneer facing.
- D. Bond edge banding to cores.
- E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.
- F. Factory pre-fit doors for frame opening dimensions identified on shop drawings.

2.5 FINISH

- A. Finish in accordance with the requirements of Section 099000.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Trim door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to a maximum of 3/4 inch.
- D. Pilot drill screw and bolt holes.
- E. Machine cut for hardware. Core for handsets and cylinders.
- F. Coordinate installation of doors with installation of frames.

3.3 INSTALLATION TOLERANCES

- A. Conform to AWI requirements for fit and clearance tolerances.
- B. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taught string, corner to corner, over an imaginary 36 by 84 inch surface area.
- C. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taught string, top to bottom, over an imaginary 36 by 84 inch surface area.
- D. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taught string, edge to edge, over an imaginary 36 by 84 inch surface area.

3.4 ADJUSTING

- A. Adjust work under provisions of Section 017800.
- B. Adjust door for smooth and balanced door movement.

END OF SECTION

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Exterior stile and rail wood doors.
 - 2. Finishing stile and rail wood doors.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - 1. Include details of construction and glazing.
 - 2. Include factory-finishing specifications.
 - B. Shop Drawings: For stile and rail wood doors. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:
 - 1. Locations and dimensions of mortises and holes for hardware.
 - 2. Requirements for veneer matching.
 - 3. Doors to be factory finished and finish requirements.
 - C. Samples for Initial Selection: For factory-finished doors.
 - D. Samples for Verification: Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish Sample with same materials proposed for factory-finished doors.
- 1.4 INFORMATIONAL SUBMITTALS
 - A. Product Certificates: For each type of door, from manufacturer.
 - B. Sample Warranty: For special warranty.
 - C. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- 1.5 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Comply with requirements of referenced standard and manufacturer's written instructions.
 - B. Package doors individually in opaque plastic bags or cardboard cartons.
 - C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
- 1.7 WARRANTY
 - A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship, or have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, within specified warranty period.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Exterior Doors: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain stile and rail wood doors from single manufacturer.

2.2 MATERIALS

- A. General: Use only materials that comply with referenced standards and other requirements specified.
 - 1. Assemble exterior doors and sidelites, including components, with wet-use adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.
 - 2. Assemble interior doors, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.
- B. Panel Products: Any of the following unless otherwise indicated:
 - 1. Particleboard made from wood particles[, with binder containing no urea-formaldehyde], complying with ANSI A208.1, Grade M-2.
 - 2. Particleboard made from straw, complying with ANSI A208.1, Grade M-2, except for density.
 - 3. Medium-density fiberboard made from wood fiber, complying with ANSI A208.2, Grade 130.
 - 4. Hardboard complying with ANSI A135.4.
 - 5. Veneer-core plywood.

2.3 EXTERIOR STILE AND RAIL WOOD DOORS

- A. Thermal Transmittance: Maximum whole fenestration product U-factor of 0.40, according to AAMA 1503, ASTM E 1423, or NFRC 100.
- B. Exterior Stile and Rail Wood Doors: Exterior custom doors complying with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards," and with other requirements specified.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Algoma Hardwoods, Inc.
 - b. Eggers Industries.
 - c. Maiman Company (The).
 - d. Marshfield DoorSystems, Inc.
 - e. VT Industries, Inc.
 - 2. Panel Designs: Indicated on Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
 - 3. Grade: Custom.
 - 4. Finish: Transparent.
 - 5. Wood Species and Cut for Transparent Finish: Species indicated in schedule, plain sawed/sliced.
 - 6. Door Construction for Transparent Finish:
 - a. Stile and Rail Construction: Veneered, structural composite lumber or veneered, edge- and end-glued clear lumber. Select veneers for similarity of grain and color, and arrange for optimum match between adjacent pieces. Use veneers not less than 1/16 inch thick.
 - 7. Stile and Rail Widths: As indicated.
 - 8. Molding Profile (Sticking): As selected by Architect from manufacturer's full range.
 - 9. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
 - 10. Mark, label, or otherwise identify stile and rail wood doors as complying with WDMA I.S.6A and grade specified.
- C. Sliding Barn Door Hardware: As selected by Architect.

2.4 FINISHING

- A. Finish wood doors at factory that are indicated to receive transparent finish.
- B. For doors indicated to be factory finished, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards," and with other requirements specified.
 - 1. Finish faces and all four edges of doors, including mortises and cutouts. Stains and fillers may be omitted on edges of cutouts, and mortises.
- C. Transparent Finish:
 - 1. Grade: Custom.
 - 2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 11, catalyzed polyurethane.
 - 3. Effect: Filled finish.
 - 4. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory -Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081433

SECTION 081550

INSULATED STEEL DOOR AND FRAME UNITS

PART 1 - GENERAL

- 1.1 WORK INCLUDED
 - A. Pre-finished, steel faced, insulated, door and frame units.
- 1.2 SUBMITTALS
 - A. Submit shop drawings and product data under provisions of Section 013000.
 - B. Indicate door elevations, stile and rail reinforcement, and internal blocking for hardware attachment.
 - C. Submit manufacturer's installation instructions under provisions of Section 013000.
- 1.3 DELIVERY, STORAGE, AND PROTECTION
 - A. Protect products under provisions of Section 01600.
 - B. Protect doors with resilient packaging.
- 1.4 WARRANTY
 - A. Provide five year manufacturer's warranty under provisions of Section 017800.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following:
 - 1. Entergy by Ceco Corp.
 - 2. Americana by Fenestra Corp.
 - 3. Permadoor by American Standard.
 - 4. Benchmark.
 - 5. Stanley.
 - 6. Pease Industries.
 - 7. Therma-tru.
 - B. Substitutions: Under provisions of Section 016000.
- 2.2 DOOR TYPES AND CONSTRUCTION
 - A. Insulated Steel Exterior Doors: Minimum 24 gage galvanized steel pre-finished face panels, 18 gage channel perimeter and hinge reinforcement, 1-3/4 inch thick with high density urethane foam core. Provide complete in wood frame (metal frame required at fire rated doors) with magnetic or compressible weatherstripping, lipped water-tight threshold, 1-1/2 pair of butt hinges (US4 finish), double bore for 2-3/8 inch backset, and door sweep. Provide in the following styles:
 - 1. Metal clad insulated multi-panel door at each unit entry and between unit and garage. Refer to Drawings for number of panels.
 - 2. Metal clad insulated full glass (with simulated divided lights) at balconies.
 - 3. Flush panel at utility areas (storage closets, etc).
 - 4. Refer to drawings for details.
 - B. Minimum R value of 10.0.
- 2.3 FABRICATION
 - A. Prepare doors to receive hardware. Machine cut relief for hinges, closers, and coring for handsets and cylinders.
 - B. Fire rated doors are to have label attached to door and frame and to have smoke seal gaskets as approved by authorities having jurisdiction.
- 2.4 FINISH
 - A. Prime paint facing and edges.
 - B. Finish: Prime painted for field finishing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions.
- B. Pilot drill screw and bolt holes.
- C. Prepare doors to receive finish hardware.
- D. Install hardware in accordance with manufacturer's instructions.
- E. Conform to manufacturer's recommendations for fit tolerances.
- F. Set door threshold in bed of mastic.

3.2 INSTALLATION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.3 ADJUSTING/CLEANING/REPAIR/REPLACEMENT

- A. Adjust for smooth and balanced door movement.
- B. Do not install doors with dents or scratches.
- C. Clean doors prior to field painting.

END OF SECTION

SECTION 083100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall access door and frame units.
- B. Ceiling access door and frame units.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Manufacturer's Installation Instructions: Indicate installation requirements.
- D. Project Record Documents: Record actual locations of all access units.

PART 2 PRODUCTS

2.1 ACCESS DOOR AND PANEL APPLICATIONS

2.2 WALL AND CEILING UNITS

- A. Manufacturers:
 - 1. Acudor Products Inc : www.acudor.com.
 - 2. Karp Associates, Inc : www.karpinc.com.
 - 3. Milcor by Commercial Products Group of Hart & Cooley, Inc : www.milcorinc.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Access Doors: Factory fabricated door and frame units, 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.
 - 1. Material: Steel.
 - 2. Door Style: Single thickness with rolled or turned in edges.
 - 3. Frames and flanges: 0.058 inch steel.
 - 4. Door panels: 0.070 inch single thickness steel sheet.
 - 5. Units in Fire Rated Assemblies: Fire rating as required by applicable code for the fire rated assembly in which they are to be installed.
 - a. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.
 - b. Provide certificate of compliance from authority having jurisdiction indicating approval of fire rated doors.
 - 6. Steel Finish: Primed.
 - 7. Primed Finish: Polyester powder coat; manufacturer's standard color.
 - 8. Size(s): As indicated.
 - 9. Hardware:
 - a. Hardware for Fire Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
 - c. Hinge: Non-Fire-Rated Units: 175 degree steel hinges with removable pin.
 - d. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - 10. Galvanized, hot dipped finish.
 - 11. Stainless steel at wet locations.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings are correctly sized and located.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings. Secure rigidly in place.
- C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION

SECTION 083610

METAL SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Electrically operated overhead sectional doors.
 - B. Steel panels of raised panel design.
 - C. Operating hardware and supports.
- 1.3 QUALITY ASSURANCE
 - A. Manufacturer: Company specializing in overhead door construction with three years minimum experience providing doors on projects of comparable size.
 - B. Applicator: Company specializing in installing overhead doors with three years minimum experience.
- 1.4 REGULATORY REQUIREMENTS
 - A. Conform to applicable codes for motor and motor control requirements.
- 1.5 SUBMITTALS
 - A. Submit shop drawings and product data under provisions of Section 013300.
 - B. Indicate opening dimensions and tolerances, component construction, connections and details, anchorage methods and spacing, hardware and locations, and installation details.
 - C. Submit manufacturer's installation instructions under provisions of Section 013300.
 - D. Include data for motor and transmitter, shaft and gearing, lubrication frequency, control adjustments, and source for spare parts.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
 - A. Windsor Door Company.
 - B. Overhead Door Company.
 - C. Hollywood Door Company.
 - D. Substitutions: Under provisions of Section 0125000.
- 2.2 MATERIALS
 - A. Sheet Steel: ANSI/ASTM A526; galvanized to 1.25 oz/sq ft flat panels.
 - B. Weatherstripping: Resilient and hollow rubber or neoprene strip.
 - C. Metal Primer Paint: Zinc chromate type.

2.3 COMPONENTS

Panels: Raised panel, formed steel construction; with reinforced steel roll formed shapes on back side; rabbeted weather joints at meeting rails.

- A. Track: Rolled steel track, continuous, vertical mounted; galvanized steel mounting brackets.
- B. Hinge and Roller Assemblies: Hinges and adjustable roller holders of galvanized steel; floating hardened steel ball bearing rollers, located at top and bottom of each panel at meeting joint.
- C. Lock: Inside side mounted, adjustable keeper, spring activated latch bar with feature to keep in locked or retracted position; interior and exterior handle; lock keyed differently.
- D. Lift Mechanism: Extension spring on cross head shaft, with braided steel lift cables.
- E. Electric Operator: NEMA Type 1, UL approved motor; center mounted; adjustable safety friction clutch; brake system actuated by independent voltage solenoid controlled by motor starter; enclosed gear driven limit switch; enclosed magnetic cross line reversing starter, mounting brackets and hardware; chain driven, 1/4 HP motor, with resilient isolator pads mounted between operator and structure to which it is attached to minimize structure borne noise transmission.
- F. Control Station:
 - 1. Remote radio control: One for each operator; factory set frequency matched to controller.

2.4 FINISHES

- A. Steel Door: Shop precoated with manufacturer's standard primer. Refer to Section 09910 for field finishing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within limits.
- B. Beginning of installation means acceptance of existing surfaces.

3.2 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

3.3 INSTALLATION

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service. Complete wiring from disconnect to unit components.

3.4 ADJUSTING AND CLEANING

- A. Adjust door assembly.
- B. Clean doors.
- C. Remove labels and visible markings.

END OF SECTION

SECTION 084323

STEEL-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents: Conditions of the Contract, Division 01 - General Requirements, and Drawings apply to Work of this Section.
- B. Section Includes:
 - 1. Interior and Exterior Entrance Doors and Frames, Sidelites, and Transoms where applicable, thresholds and hardware as specified in the drawings.

1.2 SUBMITTAL

- A. General: Submit in accordance with Section 013000.
- B. Product Data:
 - 1. Submit manufacturer's descriptive literature and product specifications.
 - 2. Include information for factory finishes, hardware, accessories and other required components.
 - 3. Include color charts for finish indicating manufacturer's standard colors available for selection.
- C. Shop Drawings:
 - 1. Submit shop drawings covering fabrication, installation and finish of specified systems.
 - 2. Include following:
 - a. Fully dimensioned plans and elevations with detail coordination keys.
 - b. Locations of exposed fasteners and joints.
 - 3. Provide detailed drawings of:
 - a. Composite members.
 - b. Joint connections for framing systems and for entrance doors.
 - c. Anchorage.
 - d. System reinforcements.
 - e. Expansion and contraction provisions.
 - f. Hardware, including locations, mounting heights, reinforcements and special installation provisions.
 - g. Glazing methods and accessories.
 - h. Internal sealant requirements as recommended by sealant manufacturer.
 - 4. Schedule of finishes.
- D. Samples:
 - 1. Submit samples indicating quality of finish, in required colors, on alloys used for work, in sizes as standard with manufacturer.
 - 2. Where normal texture or color variations are expected, include additional samples illustrating range of variation.
- E. Test Reports:
 - 1. Standard Systems: Submit certified copies of previous test reports substantiating performance of system in lieu of re-testing. Include other supportive data as necessary.
- F. Certificates:
 - 1. Submit manufacturer's certification stating that systems are in compliance with specified requirements.
- G. Qualification Data:
 - 1. Submit installer qualifications verifying years of experience.
 - 2. Include list of projects having similar scope of work identified by Brand name, location, date, references, contact, and phone number.
- H. Manufacturer's Instructions: Submit manufacturer's printed installation instructions.

1.3 QUALITY ASSURANCE

- A. The manufacturer must have been regularly engaged in the manufacture and installation of Steel doors for a period of no less than ten (10) years.
- B. Single Source Responsibility:
 - 1. To ensure quality of appearance and performance, obtain materials for each system from either a single manufacturer or from manufacturer approved by each system manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 016000.

- B. Protect finished surfaces as necessary to prevent damage.
- C. Do not use adhesive papers or sprayed coatings that become firmly bonded when exposed to sun.
- D. Do not leave coating residue on any surfaces.
- E. Replace damaged units.

1.5 WARRANTY

- A. Provide warranties in accordance with Section 017700.
- B. Entrance and framing systems shall be warranted against defective materials and workmanship for 5 years after completion of installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product. Acceptable manufacturers include, but are not limited to the following:
 1. Cantera Doors

2.2 MATERIALS AND ACCESSORIES

- A. Material:
 1. Steel Door: Galvanized Steel G90, thickness as indicated.
 2. Finish: Fluoropolymer coating.
 3. Frames: Thickness as indicated.
- B. Fasteners:
 1. Steel or Stainless Steel Anchors
- C. Stile and Rail profiles or seamless face as shown on drawings
- D. Bottom rail height may be stipulated by Code.
- E. Doors:
 1. Joint between stiles and rails shall be butt. Where welding on joint is necessary, surfaces will be grinded smooth.
 2. Finish is to be applied to the door after fabrication.
 3. Door Thickness and Framing Dimensions: As indicated or selected by Architect.
 4. All reinforcing material to be welded to door body.
- F. Frames:
 1. Minimum face dimension of frame to be 1-5/8" (41.3 mm).
 2. Minimum depth of frame to be 1/2" (12.7 mm).
 3. Consult factory for dimensions less than those above.
 4. Frames shall be erected without the use of exposed screws where feasible.
 5. The finish is to be applied to the frame after fabrication to ensure a blemish-free finish.
- G. Weather strip:
 1. Shall be manufacturer's standard polypropylene pile or as specified on the drawings.
 2. Shall occur:
 - a. Vertically at meeting stiles on pairs of doors.
 - b. At Top and Bottom rails.
 - c. At door stops at both hinge and strike jambs.
- H. Thresholds:
 1. Shall be furnished if specified
- I. Finish hardware:
 1. Hardware shall be as specified in Door Hardware Section

2.3 GLASS AND GLAZING ACCESSORIES

- A. Low-e-coated, clear insulating glass.
 1. Basis-of-Design Product: Cardinal Glass Industries; Lo³ - 366.
 2. Overall Unit Thickness: 1 inch.
 3. Thickness of Each Glass Lite: 6.0 mm.
 4. Outdoor Lite: Heat-strengthened float glass; Fully tempered float glass where required by code.
 5. Interspace Content: Air.
 6. Indoor Lite: Heat-strengthened float glass; Fully tempered float glass where required by code.
 7. Low-E Coating: Sputtered on second surface.
 8. Visible Light Transmittance: 65 percent minimum.
 9. Winter Nighttime U-Factor: 0.29 maximum.
 10. Solar Heat Gain Coefficient: 0.27 maximum.

11. Provide safety glazing labeling.

2.4 FABRICATION

- A. Fabricate components in accordance with approved shop drawings. Shop fabricate to greatest extent practicable to minimize field cutting, splicing and fastening. Remove burrs from cut edges.
- B. Fabricate system as indicated on approved shop drawings. Any welding shall be in accordance with AWS standards, performed by qualified welders. Do not distort members or deface exposed finish. Grind exposed welds smooth.
- C. Factory preparation per manufacturer templates for finish hardware. Mortise and reinforce frames and door stiles and rails to receive finish hardware in accordance with approved shop drawings
- D. Prior to leaving factory, all doors and frames shall be assembled and "hung". All necessary adjustments shall be made to provide proper perimeter clearance between door and frame and all coordination between door, frame and finish hardware shall be tested.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Openings shall conform to details and dimensions shown on the approved shop drawings.
- B. The Contractor prior to installation must correct conditions that may adversely affect the door installation.

3.2 INSTALLATION

- A. All materials shall be installed by factory trained erectors in strict accordance with installation data provided by factory and these specifications.
- B. All doors shall be adjusted after glazing contractor completes his work and install doors in strict accordance with the approved shop drawings and all local, state and national laws and building codes.
- C. Set doors plumb, level and true to line without warp or crack of frames.
- D. Anchor doors securely to surrounding construction with approved fasteners
- E. The exterior joints between the frames, trims and mullions shall be properly sealed watertight with an approved sealant and be neatly pointed.
- F. Any abraded surface of the door and frame finish shall be cleaned and touched up with air dry paint furnished by the door manufacturer in a color to match the factory applied finish.

3.3 CLEANING

- A. The General Contractor shall be responsible for protecting the doors, frames and related materials during storage on the job and during and after installation.
- B. Installer shall leave the doors and frames surfaces clean after installation, exercising care to avoid damage to protective coatings and finishes.
- C. Any protection necessary due to the cleaning of materials adjacent to the doors and frames shall be the responsibility of the General Contractor.

END OF SECTION

SECTION 085313

VINYL WINDOWS AND DOORS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Factory fabricated tubular extruded plastic windows and doors.
 - B. Factory glazed including infill panels.
 - C. Operating hardware.
 - D. Insect screens.
 - E. Perimeter sealant.
- 1.2 PERFORMANCE REQUIREMENTS
- A. Performance Requirements: As specified in PART 2, with the following additional requirements:
 - B. Forced Entry Resistance: Conform to ASTM F 588 requirements for performance level 10 for window type A.
 - C. System Design: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of window.
 - 1. Calculate design pressures in accordance with applicable code
 - 2. Measure performance of units by testing in accordance with ASTM E 330, using test pressure equal to 1.5 times the design wind pressure and 10 second duration of maximum load.
 - D. Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.
 - E. Assembly: To accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
 - F. Air Infiltration: Limit air infiltration through assembly to 0.3 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.
 - G. Vapor Seal: No vapor seal failure at interior static pressure of 1 inch, 72 degrees F, and 40 percent relative humidity.
 - H. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
 - I. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapor retarder.
 - J. Thermal Movement: Design sections to permit movement caused by thermal expansion and contraction of plastic to suit glass, infill, and perimeter opening construction.
 - K. Provide windows and doors with U value, SHGC, and SC values as required to meet energy code requirements.
- 1.3 SUBMITTALS
- A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide component dimensions, anchorage and fasteners, glass, internal drainage details.
 - C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements.
 - D. Samples: Submit two illustrating window frame section.
 - E. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
 - F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 - G. Provide requirement for prefabricated mulled windows with lab testing data to be provided with submittal
- 1.4 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 the work of this section with minimum three years of experience.
 - A. Conduct a preconstruction meeting with the window contractor to review materials, submittals, and project details as well as requiring an in-place window installation mock-up to review the installation process and details.

- 1.5 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.
- 1.6 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.
- 1.7 WARRANTY
 - A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
 - B. Correct defective Work within a five year period after Date of Substantial Completion.
 - C. Provide 10 year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of color finish.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Tubular Plastic Windows:
 - 1. CertainTeed Corporation.
 - 2. Crestline Windows and Doors; SNE Enterprises, Inc.
 - 3. Fleetwood Windows & Doors.
 - 4. JELD-WEN, Inc.
 - 5. Kolbe & Kolbe Millwork Co., Inc.
 - 6. Pella Corporation.
 - 7. Thermal Windows, Inc.
 - 8. Substitutions: See Section 016000 - Product Requirements.
- 2.2 COMPONENTS - WINDOWS
 - A. Windows: Extruded, hollow, tubular, ultra-violet resistant polyvinyl chloride (PVC) with integral color; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.
 - 1. Performance Requirements: AAMA DP-35.
 - 2. Configuration: Fixed, non-operable and single hung sash.
 - 3. Color: Color as selected.
 - B. Sills: extruded aluminum; sloped for positive wash; fit under sash to 1/2 inch beyond wall face; one piece full width of opening.
 - C. Insect Screen Frame: Rolled aluminum frame of rectangular sections; fit with adjustable hardware; nominal size similar to operable glazed unit.
 - D. Operable Sash Weather Stripping: Wool pile; permanently resilient, profiled to effect weather seal.
 - E. Fasteners: Stainless steel.
- 2.3 COMPONENTS – SLIDING GLASS DOORS
 - A. Performance Requirements: AAMA DP-40.
 - B. Construction:
 - 1. 2-Lite Unit: One rolling and one stationary panel, or as otherwise indicated on Drawings.
 - 2. Sill design engineered for drainage to the exterior.
 - 3. Integral nail fin and screen track.
 - 4. Aluminum screen frame with fiberglass.
 - 5. Mesh screening.
 - 6. Interlocking meeting rail.
 - 7. Adjustable nylon rollers.
 - 8. Multi point locking hardware.
- 2.4 GLASS AND GLAZING MATERIALS
 - A. Glass and Glazing Materials: Clear glass, meeting ASTM C1036, glazing select quality, thickness as standard with manufacturer for spans encountered; insulated double pane construction. Provide with low "E" coating. Provide fully tempered where required by code.
- 2.5 SEALANT MATERIALS
 - A. Perimeter Sealant and Backing Materials: S-GP Type as specified in Section 079005.

- 2.6 **HARDWARE**
- A. Double Hung Sash: Metal and nylon spiral friction slide cylinder, each sash, each jamb.
 - B. Fall Protection (for windows above the ground floor level): Opening of all windows beyond 4 inches must require 2 simultaneous motions. Opening control devices must meet requirements of ASTM F2090.
- 2.7 **FABRICATION**
- A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
 - B. Form sills and stools in one piece. Slope sills for wash.
 - C. Form snap-in glass stops, closure molds, weather stops, and flashings of extruded PVC for tight fit into window frame section.
 - D. Form weather stop flange to perimeter of unit.
 - E. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 - F. Arrange fasteners to be concealed from view.
 - G. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
 - H. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.
 - I. Double weatherstrip operable units.
 - J. Factory glaze window units.

PART 3 - EXECUTION

- 3.1 **EXAMINATION**
- A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.
- 3.2 **INSTALLATION**
- A. Install window units in accordance with manufacturers instructions.
 - B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
 - C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
 - D. Install sill.
 - 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. Coordinate attachment and seal of perimeter air and vapor barrier materials.
 - G. Install perimeter sealant and backing materials in accordance with Section 079005.
- 3.3 **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.
- 3.4 **ADJUSTING**
- A. Adjust hardware for smooth operation and secure weathertight closure.
- 3.5 **CLEANING**
- A. Remove protective material from pre-finished surfaces.
 - B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
 - C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Furnish, install, check, and service items of finish hardware for wood and hollow steel doors.
- 1.2 COORDINATION
- A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.
- 1.3 QUALITY ASSURANCE
- A. Manufacturers: Companies specializing in manufacturing door hardware with minimum 3 years experience.
 - B. Hardware Supplier: Company specializing in supplying door hardware with 2 years experience.
 - C. Hardware Installer: Employ a qualified carpentry person to perform the work of this Section.
 - D. Manufacturers: Items of other manufacturers than those scheduled will be acceptable for substitution provided they meet the quality standards of this Specification for finish, function and grade and substitution requests are made in accordance with Section 016000.
- 1.4 REGULATORY REQUIREMENTS
- A. Conform to applicable building code for requirements applicable to fire rated doors and frames.
 - B. Conform to the applicable sections of Chapter 5 of NFPA 101, NFPA 80, and NFPA 252.
 - C. Comply with provisions of ANSI A117.1 and local amendments (whichever is most stringent), to accommodate handicapped persons.
 - D. Provide hardware which has been tested and listed by UL or FM for fire rated assemblies of types which comply with requirements of door and frame labels.
 - E. Comply with governing laws and ordinances.
- 1.5 SUBMITTAL
- A. Submit schedule, shop drawings, and product data under provisions of Section 013000.
 - B. Indicate locations and mounting heights of each type of hardware.
 - C. Provide product data on specified hardware.
- 1.6 PROJECT RECORD DOCUMENTS
- A. Submit under provisions of Section 017800.
 - B. Record actual locations of installed cylinders and their master key code.
- 1.7 OPERATION AND MAINTENANCE DATA
- A. Submit operation and maintenance data under provisions of Section 017800.
 - B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver products to site under provisions of Section 016000.
 - B. Store and protect products under provisions of Section 016000.
 - C. Package hardware items individually; label and identify package with door opening code to match hardware schedule.
 - D. Deliver permanent keys to Owner direct from hardware supplier.
 - E. Protect hardware from theft by cataloging and storing in secure area.
- 1.9 COORDINATION
- A. Coordinate work under provisions of Section 017000.
 - B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- 1.10 WARRANTY
- A. Provide manufacturer's standard warranty under provisions of Section 017800.

- 1.11 MAINTENANCE MATERIALS
 - A. Provide special wrenches and tools applicable to each different or special hardware component.
 - B. Provide maintenance tools and accessories supplied by hardware component manufacturer.
- 1.12 EXTRA MATERIALS
 - A. Furnish under provisions of Section 017800.
 - B. Provide 2 percent overage of each type locksets required on the project.

PART 2 - PRODUCTS

- 2.1 GENERAL
 - A. Hardware shall be complete with all necessary screws, bolts, anchors or other fastenings for proper application of suitable size and type, and match hardware as to materials and finish.
- 2.2 LOCKSETS
 - A. All locks are bored style of weight, design, function and materials as specified. Faces shall be rabbited, beveled or rounded as required.
 - B. Strike lips: Length to protect jamb trim.
 - C. Strikes: Plaster back boxes as standard equipment.
 - D. Backsets: 2-3/8 inches for doors within living units; 2-3/4 for common area doors, unless noted otherwise.
 - E. Acceptable Manufacturers (within living unit):
 - 1. BHP.
 - 2. Faultless.
 - 3. Kwikset.
 - 4. Schlage.
 - 5. Weslock.
 - F. Acceptable Products (non-accessible units):
 - 1. Single Cylinder Deadbolt: Kwikset no. 660.15.
 - 2. Keyless Privacy Deadbolt: Kwikset no. 663.
 - 3. Exterior passage: Kwikset no. 200BL15.
 - 4. Storage lock (first floor only): Kwikset no. 405BL15.
 - 5. Storage lock (elevated floors): Kwikset no. 405BL15.
 - 6. Passage set: Kwikset no. 200BL15.
 - 7. Privacy lock: Kwikset no. 300BL15.
 - 8. Dummy Knob: Kwikset no. 488BL15.
 - G. Acceptable Products (accessible units):
 - 1. Single Cylinder Deadbolt: Kwikset no. 660.15
 - 2. Keyless Privacy Deadbolt: Kwikset no. 663.
 - 3. Exterior passage: Kwikset no. 200BL15.
 - 4. Storage lock: Kwikset no. 405BL15.
 - 5. Passage set: Kwikset no. 200BL15.
 - 6. Privacy lock: Kwikset no. 300BL15.
 - 7. Dummy Knob: Kwikset no. 488BL15.
 - H. Acceptable Manufacturers (common area doors):
 - 1. Sargent.
 - 2. Schlage.
 - 3. Yale.
 - 4. Corbin Russwin.
 - I. Acceptable Products (common area doors):
 - 1. Refer to schedule on Drawings.
- 2.3 DOOR CLOSERS
 - A. Door Closers: Do not install on the outside of any exterior door nor on the corridor side of any room door.
 - B. Whenever it is necessary to install a closer on the side of the door away from the butts, use parallel arm.
 - C. Corner of soffit brackets are not permitted unless no other method of installation is possible.
 - D. Fasten all closers with through bolts and grommet nuts.

2.4 HINGES

- A. Hinges: Sufficient throw to clear the door plinth or cove base, but no more than necessary.
- B. Hinges for out opening exterior doors shall have pins held in place by a set screw which can only be removed while the door is open.
- C. Provide each exterior door with 1-1/2 pair hinges and each interior 1-3/8 inch doors with one pair (2 pair on doors over 7'-6" tall) as follows:
 - 1. 1-3/4 inch doors up to 3'-0" wide: 4-1/2 inch by throw required to clear trim.
 - 2. 1-3/4 inch doors over 3'-0" wide: 5 inch by 4 BBX throw required to clear trim.
 - 3. 1-3/8 inch doors up to 3'-0" wide: 3-1/2 inch by throw required to clear trim.
- D. Spring Hinges: Stanley no. 2060 or approved equal.
- E. Double Acting Spring Hinge: McKinney 1001, 3 inch, one pair per door.
- F. Provide swing clear type hinges on all doors requiring access by the disabled.
- G. Acceptable Manufacturers
 - 1. Stanley.
 - 2. Hager Hinge Co.
 - 3. McKinney.
 - 4. Lawrence.
 - 5. Ives.

2.5 STOPS

- A. Where fastened to concrete, shall be by machine screws and tampin shields; where fastened to walls shall be by toggle bolt or tampin shields.
- B. Acceptable Manufacturers: Harney for flexible stops and rigid hinge stops.

2.6 DOOR SILENCERS

- A. Ives No. 20 for doors with steel frames. Furnish 3 silencers for each single door; 4 for each pair of doors.

2.7 MISCELLANEOUS HARDWARE - ACCEPTABLE MANUFACTURERS

- A. Knocker/Viewer: Harney.
- B. Thresholds and Weatherstripping: Zero, Master, May, Pemko, Reese, Ceco for metal doors in metal frames; others are pre-hung using manufacturer's standard.
- C. Bi-fold Knobs: JVJ414.

2.8 KEYING

- A. Door Locks: Construction keyed including construction keying, as selected by Owner at meeting to obtain keying requirements.
- B. Supply 4 keys for each unit.

2.9 KEY CABINETS

- A. Key Cabinet: Sheet steel construction, piano hinged door with cylinder type lock master keyed to building system.
- B. Cabinet Size: Large enough to accommodate 120% of keys presently scheduled.
- C. Internal hooks for keys.
- D. Horizontal metal strips for key hook labeling with plastic strip cover over paper labels.

2.10 FINISHES

- A. Finishes: All finishes are US26D unless noted otherwise.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that doors and frames are ready to receive work and dimensions are as instructed by the manufacturer.
- B. Verify that power supply is available to power operated devices.
- C. Beginning of installation means acceptance of existing conditions.

- 3.2 INSTALLATION
- A. Install hardware in accordance with manufacturer's instructions and requirements of SDI, ANSI/NFPA 80, BHMA and DHI.
 - B. Use the templates provided by hardware item manufacturer.
 - C. Conform to ANSI A117.1 for positioning requirements for the handicapped.
 - D. All butts, locks, plates, strikes, etc., shall be neatly and accurately mortised flush, properly placed and accurately aligned for smooth and quiet operation without sticking, binding, hanging, or rattling. All doors shall be hung with equal clearance at jambs and heads. Adjust all hardware properly and leave in smooth operating condition.
- 3.3 SCHEDULE - UNITS
- A. Typical Unit Entrance Doors
 - 1. 1-1/2 pr butt hinges
 - 2. 1 lock set
 - 3. 2 dead bolt locks (one with key outside and thumb turn inside; one with thumb turn inside only)
 - 4. 1 door stop
 - 5. 1 knocker/viewer
 - 6. 1 unit number plate
 - 7. 1 threshold
 - 8. 1 weatherstripping
 - 9. 1 door sweep
 - B. Interior Doors at Bathrooms and Bedrooms
 - 1. 1-1/2 pr butt hinges
 - 2. 1 privacy set
 - 3. 1 door stop
 - C. Other Interior Swinging Doors
 - 1. 1-1/2 pr butt hinges
 - 2. 1 passage set
 - 3. 1 door stop
 - D. Bi-fold and Sliding Doors:
 - 1. Hardware provided by door manufacturer.
- 3.4 SCHEDULE – COMMON AREA DOORS
- A. Refer to Schedule on Drawings.

END OF SECTION

SECTION 088300

MIRRORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass mirrors.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data on Mirror Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual for glazing installation methods.
- B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with recommendations of GANA (TIPS) "Mirrors Handle with Extreme Care: Tips For the Professional on the Care and Handling of Mirrors."

1.4 FIELD CONDITIONS

- A. Do not install mirrors when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.5 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Mirrors:
 - 1. Binswanger Mirror/ACI Distribution: www.binswangerglass.com.
 - 2. Lenoir Mirror Co: www.lenoirmirror.com.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.2 MATERIALS

- A. Mirror Glass - General: Select materials and/or provide supports as required to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
- B. Mirror Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 (mirror select); silvering, protective coating and physical characteristics complying with ASTM C1503; 6 mm minimum thick.
 - 1. Sizes noted on Drawings.

2.3 GLAZING ACCESSORIES

- A. Glazing Clips: Manufacturer's standard type.
- B. Mirror Attachment Accessories: Stainless steel clips.
- C. Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings for mirrored glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive mirrors.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.
- C. Perform installation in accordance with ASTM C1193 for solvent release sealants. Install sealant in accordance with manufacturer's instructions.

3.3 INSTALLATION - GENERAL

- A. Install mirrors in accordance with GANA recommendations.
- B. Set mirrors plumb and level, free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.
- D. Installation in Frames:
 - 1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
 - 2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
 - 3. Rest mirrors on setting blocks and push against tape for full contact at perimeter of pane or unit.
 - 4. Place glazing tape on free perimeter of mirrors in same manner described above.
 - 5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
 - 6. Knife-trim protruding tape.
- E. Frameless Mirrors: Set mirrors with clips and adhesive. Anchor rigidly to wall construction.

3.4 CLEANING

- A. Remove wet glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean mirrors and adjacent surfaces.

3.5 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 092116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Gypsum wallboard.
- C. Joint treatment and accessories.
- D. Textured finish system.

1.2 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board application and finishing , with minimum three years of documented experience.

1.3 SUBMITTALS

- A. Submit under provisions of Section 013000.
- B. Product Data: Provide data on metal framing, gypsum board, joint tape and joint compound.
- C. Submit manufacturer's installation instructions for each product proposed for use.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
 - 1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

2.2 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC : www.clarkdietrich.com.
 - 2. Marino : www.marinoware.com.
 - 3. Phillips Manufacturing Company : www.phillipsmfg.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Furring: Hat-shaped sections, minimum depth of 7/8 inch, resilient type.

2.3 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum : www.americangypsum.com.
 - 2. American Gypsum: www.americangypsum.com.
 - 3. CertainTeed Corporation : www.certainteed.com.
 - 4. Georgia-Pacific Gypsum : www.gpgypsum.com.
 - 5. National Gypsum Company : www.nationalgypsum.com.
 - 6. Temple-Inland Inc: www.templeinland.com.
 - 7. USG Corporation : www.usg.com.
 - 8. Substitutions: See Section 016000 - 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.
 - 2. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 - 3. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - 4. Paper-Faced Products:
 - a. American Gypsum; EagleRoc Regular Gypsum Wallboard and FireBloc Type X Gypsum Wallboard.
 - b. CertainTeed Corporation; ProRoc Brand Gypsum Board.
 - c. Georgia-Pacific Gypsum; ToughRock, ToughRock Fireguard, and ToughRock FireGuard C Gypsum Wallboard.
 - d. National Gypsum Company; Gold Bond Brand Gypsum Wallboard.
 - e. Temple-Inland Inc; Gypsumboard and Gypsum Board Fire Resistant Panels Type X and Type TGC.
 - f. USG Corporation; Sheetrock Brand Gypsum Panels.
 - g. Substitutions: See Section 016000 - Product Requirements.
- C. Backing Board For Wet Areas: One of the following products:
 - 1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 3. Glass-Mat-Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178.
 - a. Fire-Resistant Type: Type X core, thickness 5/8 inch.
 - b. Products:
 - 1) Georgia-Pacific Gypsum; DensShield Tile Backer.
 - 2) National Gypsum Company; Gold Bond e2XP Tile Backer.
 - 3) Temple-Inland Inc; GreenGlass Tile Backer.
- D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
 - 1. Application: Vertical surfaces behind thinset tile, except in wet areas.
 - 3. Type X Thickness: 5/8 inch.
 - 4. Edges: Tapered.
 - 5. Products:
 - a. CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.
 - b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board ("Greenboard").
 - c. Georgia-Pacific Gypsum; DensShield Tile Backer.
 - d. National Gypsum Company; Gold Bond Brand XP Gypsum Board.
 - e. Temple-Inland Inc; ComfortGuard WR.
 - f. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.
- E. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Ceilings, unless otherwise indicated.
 - 2. Thickness: 5/8 inch, type X or C as required by UL assembly. Provide water resistant type for use at exterior soffits where indicated.
 - 3. Edges: Tapered.
 - 4. Products:
 - a. American Gypsum; Interior Ceiling Board.
 - b. CertainTeed Corporation; ProRoc Interior Ceiling.
 - c. Georgia-Pacific Gypsum; ToughRock CD Ceiling Board.
 - d. National Gypsum Company; High Strength Brand Ceiling Board.
 - e. Temple-Inland Inc; Span24 Ceiling Board.
 - f. USG Corporation; Sheetrock Brand Sag-Resistant Interior Gypsum Ceiling Board.
 - g. Substitutions: See Section 016000 - Product Requirements.

2.4 ACCESSORIES

- A. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
 - 1. Types: As detailed or required for finished appearance.

- B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
 - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners , except as otherwise indicated.
 - 3. Ready-mixed vinyl-based joint compound.
 - 4. Powder-type vinyl-based joint compound.
 - 5. Chemical hardening type compound.
- C. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- D. Textured Finish Materials: Latex-based compound; plain.
- E. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type ; cadmium-plated for exterior locations.
- F. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
- G. Corner Beads: Radiused, galvanized sheet metal with perforated legs.
- H. Control Joints: Manufacturer's standard.
- I. Casing Beads: Manufacturer's standard.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.2 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
 - 1. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
 - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
 - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.3 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Studs: Space studs as permitted by standard.
 - 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.
 - 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.
- C. 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.
 - 1. Orientation: Horizontal.
 - 2. Spacing: As indicated.
- D. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.
- E. Blocking: Install wood blocking for support of:
 - 1. Framed openings.
 - 2. Wall mounted cabinets.
 - 3. Plumbing fixtures.
 - 4. Toilet partitions.
 - 5. Toilet accessories.
 - 6. Wall mounted door hardware.

3.4 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.5 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. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

3.6 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations shown on the drawings. Provide vent area specified.

1.2 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- C. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840.
 - 1. Above Finished Ceilings Concealed From View: Level 1.
 - 2. Utility Areas and Areas Behind Cabinetry: Level 2.
 - 3. Walls and Ceilings to Receive Flat or Eggshell Paint Finish and Wall Covering: Level 4.
 - 4. Walls and Ceilings to Receive Semi-Gloss or Gloss Paint Finish: Level 5.
- D. 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.
 - 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 - 3. Taping, filling and sanding is not required at base layer of double layer applications.
- E. 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.
- F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.8 TEXTURE FINISH

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.9 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 093000

TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Stone thresholds.
- D. Ceramic trim.
- E. Non-ceramic trim.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 1 percent of each size, color, and surface finish combination , but not less than 1 box of each type.

1.4 QUALITY ASSURANCE

- A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118 Series on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.6 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.1 TILE

- A. Manufacturers: All products by the same manufacturer.
 - 1. American Olean: www.americanolean.com.
 - 2. Dal-Tile Corporation: www.daltile.com.
 - 3. Summitville Tiles, Inc: www.summitville.com.
 - 4. Thorntree: www.thorntreestate.com.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Glazed Wall Tile : ANSI A137.1 , and as follows:
 - 1. Acceptable Products: Refer to Finish Legend.
 - 2. Moisture Absorption: 3.0 to 7.0 percent.
 - 3. Size and Shape: Refer to Finish Legend.
 - 4. Edges: Cushioned.
 - 5. Surface Finish: High gloss.
 - 6. Colors: As scheduled.

- C. Porcelain Wall Tile: ANSI A137.1, and as follows:
 - 1. Acceptable Products: Refer to Finish Legend.
 - 2. Moisture Absorption: 0 to 0.5 percent.
 - 3. Face: Plain.
 - 4. Edges: Cushioned.
 - 5. Size and Shape: Refer to Finish Legend.
 - 6. Colors and Surface Finish: As scheduled.
- D. Porcelain Floor Tile: ANSI A137.1, and as follows:
 - 1. Acceptable Products: Refer to Finish Legend.
 - 2. Moisture Absorption: 0 to 0.5 percent.
 - 3. Face: Plain.
 - 4. Edges: Cushioned.
 - 5. Thickness: 3/8 inch.
 - 6. Size and Shape: Refer to Finish Legend.
 - 7. Colors and Surface Finish: As scheduled.

2.2 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
 - 1. Applications: Use in the following locations:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Jointed.
 - c. Floor to Wall Joints: Cove base.
 - 2. Manufacturer: Same as for tile.
- B. Non-Ceramic Trim: Satin brass anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Manufacturer:
 - a. Schluter-Systems: www.schluter.com.
 - b. Genesis APS International: www.genesis-aps.com.
- C. Thresholds: Marble, white or gray, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.
 - 1. Applications: Provide at the following locations:
 - a. At doorways where tile terminates.

2.3 SETTING MATERIALS

- A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
 - 1. Application(s): Use this type of bond coat where indicated and where no other type of bond coat is indicated.
 - 2. Products:
 - a. Custom Building Products; MegaLite: www.custombuildingproducts.com.
 - b. LATICRETE International, Inc ; LATICRETE 254 Platinum: www.laticrete.com.
 - c. ProSpec, an Oldcastle brand ; Permalastic System: www.prospec.com.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.4 GROUTS

- A. Manufacturers:
 - 1. Custom Building Products: www.custombuildingproducts.com.
 - 2. LATICRETE International, Inc: www.laticrete.com.
 - 3. MAPEI Corporation: www.mapei.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Standard Grout: ANSI A118.6 standard cement grout.
 - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 3. Color(s): As scheduled.

- 2.5 THICK-BED MATERIALS (for use at tiled showers)
- A. Mortar Bed Materials: Portland cement, sand , latex additive, and water.
 1. Products:
 - a. LATICRETE International, Inc ; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com.
- 2.6 THIN-SET ACCESSORY MATERIALS
- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12.
 1. Thickness: 20 mils, maximum.
 2. Crack Resistance: No failure at 1/16 inch gap, minimum.
 - B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 1. Type: Mortar-bonded sheet.
 2. Material: PVC sheet membrane, 40 mils, thick, minimum.
 3. Products:
 - a. Compotite Corporation; Composeal Gold: www.compotite.com.
 - b. Substitutions: See Section 016000 - Product Requirements.
 - C. Waterproofing Membrane at Showers and Tiled Tubs: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 1. Type: Mortar-bonded sheet.
 2. Material: PVC sheet membrane, 40 mils, thick, minimum.
 3. Products:
 - a. Compotite Corporation; Composeal Blue Shower Pan: www.compotite.com.
 - b. Parex USA, Inc.; Merkrete Hydro Guard 2000: www.merkrete.com.
 - c. Substitutions: See Section 016000 - Product Requirements.
 - D. Underlayment at Floors: Specifically designed for bonding to thin-set setting mortar; not primarily a waterproofing material and having the following characteristics:
 1. Crack Isolation: Comply with ANSI A118.12.
 2. Uncoupling Function: Allow for separation between membrane and the mortar adhering tile to the membrane when subjected to excessive substrate movement.
 3. Do Not Use: Gypsum or cementitious based self-leveling underlayment.
 4. Products:
 - a. Custom Building Products; SpiderWeb Uncoupling Mat: www.custombuildingproducts.com.
 - b. LATICRETE International, Inc ; LATICRETE Hydro Ban: www.laticrete.com.
 - c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.3 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Install thresholds where indicated.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- K. Grout tile joints. Use standard grout unless otherwise indicated.
- L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.4 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
 - 1. Use uncoupling membrane under all tile unless other underlayment is indicated.
 - 2. Where waterproofing membrane is indicated, install in accordance with The Tile Council of North America Handbook Method F122, with latex-Portland cement grout.
 - 3. Where epoxy bond coat and grout are indicated, install in accordance with The Tile Council of North America Handbook Method F131.
 - 4. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with The Tile Council of North America Handbook Method F115.

3.5 INSTALLATION - FLOORS - MORTAR BED METHODS

- A. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F111, with cleavage membrane, unless otherwise indicated.
 - 1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with The Tile Council of North America Handbook Method F121.
 - 2. Where epoxy bond coat and grout are indicated, install in accordance with The Tile Council of North America Handbook Method F132, bonded.
 - 3. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with The Tile Council of North America Handbook Method F114, with cleavage membrane.
- B. Cleavage Membrane: Lap edges and ends.
- C. Waterproofing Membrane: Install as recommended by manufacturer and as specified in the section in which the product is specified.
- D. Mortar Bed Thickness: 5/8 inch, unless otherwise indicated.

3.6 INSTALLATION - SHOWERS AND BATHTUB WALLS

- A. At tiled shower receptors install in accordance with The Tile Council of North America Handbook Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
- B. Grout with standard grout as specified above.
- C. Seal joints between tile work and other work with sealant Type S-GP specified in Section 07 9005.

3.7 INSTALLATION - WALL TILE

- A. Over coated glass mat backer board on studs, install in accordance with The Tile Council of North America Handbook Method W245.

3.8 CLEANING

- A. Clean tile and grout surfaces.

3.9 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 096500

RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient flooring.
- B. Resilient base.
- C. Installation accessories.

1.2 SUBMITTALS

- A. See Section 013000 - 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.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect roll materials from damage by storing on end.

1.4 FIELD CONDITIONS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.1 FLOORING MATERIALS

- A. Vinyl Composition Tile
 - 1. FS SS-T-312, Type IV, Composition 1.
 - 2. Size: 12 by 12 inches, 1/8 inch thick.
 - 3. Acceptable Product: Refer to Finish Legend.
- B. Vinyl Plank Flooring: Meeting ASTM F 1700.
 - 1. Class: As indicated by product designations.
 - 2. Type: Type B, embossed surface.
 - 3. Thickness: 0.080 inch minimum.
 - 4. Size: 3 by 36 inches.
 - 5. Acceptable Manufacturers and Product: Refer to Finish Legend.

2.2 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
 - 1. Height: As scheduled.
 - 2. Thickness: 0.125 inch thick.
 - 3. Finish: Satin.
 - 4. Length: Roll.
 - 5. Color: Color as selected from manufacturer's standards.
 - 6. Accessories: Premolded external corners and end stops.
 - 7. Manufacturers:
 - a. Burke Flooring: www.burkemercer.com.
 - b. Johnsonite, Inc: www.johnsonite.com.
 - c. Roppe Corp: www.roppe.com.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.3 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- C. Moldings, Transition and Edge Strips: Resilient rubber.
- D. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.1 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 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.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
 - 1. Test in accordance with ASTM F710.
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is cured.
- D. Clean substrate.

3.3 INSTALLATION

- 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.

3.4 TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

3.5 RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.6 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.

3.7 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 096800

CARPETING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Carpet, stretched-in, with cushion underlay.
- B. Accessories.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
- C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples: Submit two samples in size illustrating color and pattern for each carpet material specified.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum three years experience.

1.4 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 72 hours after installation.

PART 2 PRODUCTS

2.1 CARPET

- A. Carpet:
 - 1. Acceptable Products: Refer to Finish Legend.

2.2 CUSHION

- A. Cushion Underlay: FS- LC-1369; 72 inches wide rolls; re-bonded polyurethane foam; particle size not to exceed 1/2 inch; density of 6.0 pcf plus or minus 5 percent; thickness of 1/2 inch plus or minus 1/32 inch;

2.3 ACCESSORIES

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.
- B. Tackless Strip: Carpet gripper, of type recommended by carpet manufacturer to suit application, with attachment devices.
- C. Moldings and Edge Strips: Resilient rubber; refer to Section 096500.
- D. Seam Adhesive: Recommended by manufacturer.
- E. Contact Adhesive: Compatible with carpet material.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
- D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
 - 1. Test in accordance with ASTM F710.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Clean substrate.

3.3 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet and cushion in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Verify carpet match before cutting to ensure minimal variation between dye lots.
- D. Lay out carpet and locate seams in accordance with shop drawings:
 - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
 - 2. Do not locate seams perpendicular through door openings.
 - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - 4. Locate change of color or pattern between rooms under door centerline.
 - 5. Provide monolithic color, pattern, and texture match within any one area.
- E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.4 STRETCHED-IN CARPET

- A. Install tackless strips with pins facing the wall around entire perimeter, except across door openings. Use edge strip where carpet terminates at other floor coverings.
- B. Space tackless strips slightly less than carpet thickness away from vertical surfaces, but not more than 3/8 inch.
- C. Install cushion in maximum size pieces using spot adhesive to adhere to sub-floor.
- D. Lay out cushion so that seams will be perpendicular to, or offset from, minimum 6 inches from carpet seams.
- E. Butt cushion edges together and tape seams.
- F. Trim cushion tight to edge of tackless strip and around projections and contours.
- G. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to all cut edges immediately.
- H. Join seams by hand sewing. Form seams straight, not overlapped or peaked, and free of gaps.
- I. Following seaming, hook carpet onto tackless strip at one edge, power stretch, and hook firmly at other edges. Follow manufacturer's recommendations for method and amount of stretch.
- J. Trim carpet neatly at walls and around interruptions. Tuck edges into space between tackless strip and wall.
- K. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.

3.5 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 097200
WALL COVERINGS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Surface preparation.
 - B. Wall covering.
- 1.2 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on wall covering and adhesive.
- 1.3 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
 - B. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Inspect roll materials at arrival on site, to verify acceptability.
 - B. Protect packaged adhesive from temperature cycling and cold temperatures.
 - C. Do not store roll goods on end.
- 1.5 FIELD CONDITIONS
 - A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
 - B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.
 - C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

PART 2 PRODUCTS

- 2.1 MATERIALS
 - A. Requirements for All Wall Coverings:
 - 1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
 - B. Wall Covering Products: Refer Finish Legend.
 - C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
 - D. Termination Trim: Extruded plastic, color as selected.
 - E. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.
 - B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
 - C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
 - D. Confirm Level 5 finish on substrate.
- 3.2 PREPARATION
 - A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
 - B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
 - C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
 - D. Vacuum clean surfaces free of loose particles.

3.3 INSTALLATION

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- C. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.
- D. Horizontal seams are not acceptable.
- E. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
- F. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- G. Do not install wall covering more than 1/4 inch below top of resilient base.
- H. Cover spaces above and below windows, above doors, in pattern sequence from roll.
- I. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
- J. Install termination trim.
- K. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.4 CLEANING

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

3.5 PROTECTION

- A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

SECTION 098700

CONCRETE STAINING

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Preparation of concrete floor surfaces.
 - B. Application of concrete stain and sealer.
- 1.2 QUALITY ASSURANCE
- A. Applicator: Company specializing in concrete staining with a minimum of 3 years experience in similar projects.
 - B. Mock-up: Submit four, tan to dark brown/rust color samples for Owner review. Owner will identify two color selections from Contractor provided color samples. Samples shall be actual color applied to concrete material not less than 3" x 3" size. Color selection shall be as approved by Owner from Contractor provided 5' x 5' mock-ups of two color alternatives applied over approved pavement finish. Provide mock-ups with and without sealant for each color alternative.
- 1.3 SUBMITTALS
- A. Provide product data sheets for stain and wax coatings including installation instructions.
 - B. Provide two stain samples of each color for Architect approval.
 - C. Provide maintenance instructions for finish surface.

PART 2 - PRODUCTS

- 2.1 STAIN
- A. Acid based, reactive, penetrating color stain for exterior concrete flatwork surfaces, matte non-skid finish:
 - B. Acceptable Products:
 - 1. Butterfield Perma-Cast Sierra Stain,
 - 2. Kemiko Stone Tone Stain
 - 3. L.M. Scofield Lithochrome Chemstain Classic,
 - 4. Or approved equal.
- 2.2 SEALER
- A. Color matched, non-yellowing, solvent based, penetrating clear sealant for exterior flatwork surfaces, matte non-skid finish.
 - B. Acceptable Products:
 - 1. Butterfield Color Guard Cure and Seal,
 - 2. Kemiko Excel 3000,
 - 3. L.M. Scofield Clearseal S Matte Finish,
 - 4. Or approved equal.

PART 3 - EXECUTION

- 3.1 INSPECTION AND PREPARATION
- A. Inspect concrete surfaces to receive stain to identify any detrimental conditions which would result in an unsatisfactory installation. Thoroughly clean surfaces (using methods as recommended by stain manufacturer) to remove dirt, grease, stains or other blemishes in accordance with manufacturer's recommendations. Notify Architect of conditions which cannot be properly prepared.
 - B. Allow new concrete to age a minimum of 30 days.
 - C. Confirm all concrete flatwork surfaces shall have a medium to heavy broom finish consistent with City approved
- 3.2 INSTALLATION
- A. Apply stain and sealer in strict accordance with manufacturer's printed instructions.
 - B. Apply stain in two coats at the rate of 125-200 S.F./gallon (or as otherwise recommended by manufacturer). Allow 8 hours drying time between coats. Avoid excessive puddling and lap marks.
 - C. Wet scrub floor surface after second coat of stain to remove residue and salts. Allow floor to dry 24 hours before applying sealer.
 - D. Apply sealer after thinning, in two-coat process with a special roller as recommended by manufacturer.

3.3 PROTECTION

- A. Protect stained floors from construction damage until substantial completion.

END OF SECTION

SECTION 099000
PAINTING AND COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Elevator pit ladders.
 - 3. Exposed surfaces of steel lintels and ledge angles.
 - 4. Surfaces inside cabinets.
 - 5. Prime surfaces to receive wall coverings.
 - 6. Mechanical and Electrical:
 - a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. On the roof and outdoors, paint all equipment that is exposed to weather or to view, including that which is factory-finished.
- D. 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. Stainless steel, anodized aluminum, bronze, terne, and lead items.
 - 6. Concealed pipes, ducts, and conduits.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.
- C. Samples: Submit two paper chip samples in size illustrating range of colors and light knock-down textures available for each surface finishing product scheduled.
- D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

1.3 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 three years experience.

1.4 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.

1.5 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. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Base Manufacturer: Sherwin-Williams.
 - 2. Duron, Inc: www.duron.com.
 - 3. Frazee Paint, a Comex Group Company: www.frazee.com.
 - 4. Glidden Professional: www.gliddenprofessional.com.
 - 5. Benjamin Moore & Co: www.benjaminmoore.com.
 - 6. PPG Architectural Finishes, Inc: www.ppgaf.com.
- C. Substitutions: See Section 016000 - Product Requirements.

2.2 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. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. 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.
- D. Flammability: Comply with applicable code for surface burning characteristics.
- E. Colors: As indicated on drawings
 - 1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.3 PAINT SYSTEMS - EXTERIOR

- A. Ferrous Metal Items:
 - 1. Touch up shop primer as required.
 - 2. First Coat: Sherwin-Williams, DTM Acrylic B66W1.
 - 3. Second Coat: Same as first.
- B. Galvanized Metal Items:
 - 1. Primer: Sherwin-Williams, Galvite Paint No. B50W3.
 - 2. Second Coat: Sherwin-Williams, DTM Acrylic B66W1.
 - 3. Third Coat: Same as second.
- C. Wood-Painted - Satin Finish
 - 1. One coat A-100 Alkyd Exterior Wood Primer, 2.2 mils DFT.
 - 2. One coat to cover A-100 Satin Latex House and Trim A8 Series, 1.5 mils DFT.

2.4 PAINT SYSTEMS - INTERIOR

- A. Wood - Painted Eggshell
 1. One coat: Sand-N-Go Waterborne Wood Primer, 1.3 mils DFT.
 2. One coat to cover: Pro-Mar 400 Acrylic Semi-gloss, 1.4 mils DFT/coat.
- B. Wood - Clear
 1. Two coats: Wood Classics Waterborne Polyurethane Varnish, 1.0 DFT/coat.
- C. Wood - Semi-Transparent - Stained
 1. One coat: Minwax Wood Finish.
 2. Two coats: Wood Classics Waterborne Polyurethane Varnish, 1.0 DFT/coat.
- D. Gypsum Board - Flat
 1. One coat light knock-down texture as approved by Architect.
 2. One coat: ProMar 400 Primer, 1.3 mils DFT.
 3. One coat to cover: ProMar 400 Latex Flat, 1.7 mils DFT/coat.
- E. Gypsum Board - Eggshell
 1. One coat: light knock-down texture as approved by Architect.
 2. One coat: ProMar 400 Primer, 1.3 mils DFT.
 3. One coat to cover: Promar 400 Latex Eggshell, 1.4 mils DFT/coat.
- F. Gypsum Board - Semi-gloss
 1. One coat: light knock-down texture as approved by Architect.
 2. One coat: ProMar 400Primer, 1.3 mils DFT.
 3. One coat: to cover: Promar 400, Latex Semigloss, 1.4 mils DFT/coat.
- G. Ferrous Metal Items - Eggshell (including hollow metal doors, frames, access doors/frames, handrails, etc):
 1. One coat: Pro-Cryl Universal Water Based Primer, 2-4 mils DFT.
 2. One coat to cover: Promar 400 Acrylic Semi-Gloss Enamel, 1.4 mils DFT/coat.
 3. Miscellaneous Items Exposed to View and Not Otherwise Scheduled: Finish with compatible paint to match adjacent surface finish and color.

2.5 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.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. 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.

3.2 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. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. 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.
- G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- I. 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 or power tool 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.
- J. 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.
- K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's instructions.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5 PROTECTION

- A. Protect finished coatings until completion of project.
- B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 101400

SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior code required signage.
- B. Room and door signs.
- C. Handicapped parking signs.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.5 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flat Signs:
 - 1. Best Sign Systems, Inc: www.bestsigns.com.
 - 2. InPro Corporation: www.inprocorp.com.
 - 3. Mohawk Sign Systems, Inc: www.mohawksign.com.
 - 4. Seton Identification Products: www.seton.com/aec.

2.2 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 1. Sign Type: Flat signs with engraved panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 - 3. Character Height: 1 inch.
 - 4. Sign Height: 2 inches, unless otherwise indicated.
 - 5. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

2.3 SIGN TYPES

- A. Flat Signs: Signage media without frame.
 - 1. Edges: Square.
 - 2. Corners: Square.
 - 3. Wall Mounting of One-Sided Signs: Tape adhesive.
- B. Color and Font: Unless otherwise indicated:
 - 1. Character Font: Helvetica, Arial, or other sans serif font.
 - 2. Character Case: Upper case only.
 - 3. Background Color: As scheduled.
 - 4. Character Color: Contrasting color.

2.4 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
 - 1. Total Thickness: 1/16 inch.

2.5 HANDICAPPED PARKING SIGNS

- A. Screen printed, 18 gage bonderized steel with blue baked enamel finish and white screen printed copy.
- B. Size: 12 inches by 18 inches and 12 inches by 6 inches.
- C. Copy:
 - 1. "Handicapped Parking Only".
 - 2. "Van Accessible".
- D. Acceptable Products: Handicapped Parking: Best Traffic Signs No. SS04 with SS52 as required.
- E. Post: Galvanized pipe column minimum 9 feet long.

2.6 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated:
 - 1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
 - 2. If no location is indicated obtain Owner's instructions.
- D. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION

SECTION 101855

SHOWER PANS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Tile ready shower pans.
- 1.2 SUBMITTALS
 - A. Submit under provisions of Section 013000.
 - B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- 1.3 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: A manufacturer with a minimum of ten years experience manufacturing bath and shower components.
 - B. Installer Qualifications: An installer who has demonstrated experience installing bath and shower components and as recommended by the manufacturer.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - A. Store products in manufacturer's unopened packaging until ready for installation.
- 1.5 PROJECT CONDITIONS
 - A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- 1.6 WARRANTY
 - A. Provide manufacturer's standard 5-year limited warranty.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Acceptable Manufacturers:
 - 1. Tile Redi USA, LLC - 1855-750-7334
 - 2. Kohler.
 - B. Requests for substitutions will be considered in accordance with provisions of Section 016000.
- 2.2 ACCEPTABLE PRODUCTS
 - A. One-Piece Tile Ready[®] Redi Base[®] Polyurethane Shower Pan. Sizes of 36x36, 36x48, and 36x42.
 - 1. Accessories:
 - a. Redi Poxy[™] - an epoxy adhesive used to set tile on Tile Ready Shower Pans.
 - b. Redi Flash[®] - a proprietary flashing system for water proofing seam between shower pan splash wall and shower board.
 - B. Acrylic Shower Pan: Equal to Sterling by Kohler model 62050115 (minus wall panels), in 39 x 39 inch base size.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Do not begin installation until substrates have been properly prepared.
 - B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

- 3.2 PREPARATION
 - A. Clean surfaces thoroughly prior to installation.
 - B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

- 3.3 INSTALLATION
 - A. Install in accordance with manufacturer's instructions.

- 3.4 PROTECTION
 - A. Protect installed products until completion of project.
 - B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 102330

PLASTIC WALL VENTS

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
 - A. Plastic wall vents.
- 1.2 SUBMITTALS
 - A. General: Submit following items in accordance with Section 013000.
 - B. Product Data: Including all pertinent performance characteristics and criteria.
 - C. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, and installation details.
- 1.3 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products in accordance with Section 016000.
- 1.4 WARRANTY
 - A. 40 year warranty including finish.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
 - A. Mid-America Building Products, Plymouth, Michigan.
 - B. Substitutions: Submit in accordance with Section 016000.
- 2.2 PLASTIC WALL VENTS
 - A. Material: Copolymer construction with U.V. stabilized color molded throughout.
 - B. Fully screened for complete insect protection; nailing flanges with pre-drilled holes; brush-grained finish.
 - C. Refer to Drawings for sizes and shapes.
 - D. Acceptable Product: GableMASTER Exterior Wall Vents as manufactured by Mid-America. Dampers to remain operable after paint application.
 - E. Sealant: Refer to Section 079005.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Verify that surfaces and conditions are ready to receive work of this Section.
 - B. Notify Contractor of any existing conditions which will adversely affect execution.
 - C. Beginning of execution will constitute acceptance of existing conditions.
- 3.2 PREPARATION
 - A. Prepare substrate surfaces as recommended by manufacturer.
- 3.3 INSTALLATION
 - A. Install using skilled workmen in accordance with manufacturer's printed instructions and recommendations.
 - B. Install sealant behind top and side flanges. Do not seal bottom flange. Ensure penetration to receive vent cover is sealed to substrate.
- 3.4 ADJUSTING/CLEANING
 - A. Adjust and fit items to be flush with adjacent construction.
 - B. Fasten or adhere for tight connections and joints.

END OF SECTION

SECTION 102800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Accessories for toilet rooms, residential bathrooms, and utility rooms.
- B. Grab bars.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.3 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Samples: Submit two samples of each accessory, illustrating color and finish.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Toilet Accessories:
 - 1. A & J Washroom Accessories Inc: www.ajwashroom.com.
 - 2. American Specialties, Inc: www.americanspecialties.com.
 - 3. Bobrick: www.bobrick.com.
 - 4. Bradley Corporation: www.bradleycorp.com.
 - 5. Substitutions: Section 016000 - Product Requirements.

2.2 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner ; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A666 , Type 304.
- D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
- E. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- F. Adhesive: Two component epoxy type, waterproof.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized , tamper-proof , security type.
- H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish , unless otherwise noted.

2.4 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Double roll, surface mounted, noncontrol delivery with standard spindle, satin stainless steel.
 - 1. Basis-of-Design Product: Bobrick; B69997.

- B. Combination Towel Dispenser/Waste Receptacle: Recessed flush with wall, stainless steel; seamless wall flanges, continuous piano hinges, tumbler locks on upper and lower doors.
 - 1. Waste receptacle liner: Reusable, heavy-duty vinyl.
 - 2. Towel dispenser capacity: 400 C-fold.
 - 3. Waste receptacle capacity: 4 gallons.
- C. Soap Dispenser: Liquid soap dispenser, deck-mounted on vanity, with polyethylene container concealed below deck; piston and 4 inch spout of stainless steel with bright polished finish; chrome-plated deck escutcheon.
 - 1. Minimum Capacity: 16 ounces.
- D. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, chrome surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
 - 1. Basis-of-Design Products:
 - a. Moen; Align Chrome 36" Design Grab Bar.
 - b. Moen; Secure Mount 3.17-inch Diameter concealed mounting plate.

2.5 SHOWER AND TUB ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners, curved profile unless otherwise indicated.
- B. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
- C. Towel Bars: Stainless steel Type 304, 3/4 inch square tubular bar; rectangular brackets, concealed attachment, satin finish.
 - 1. Length: 18 inches.
- D. Towel Ring: Stainless steel, 2-1/2 inch extension from wall, with 1/4 inch diameter trapezoidal shaped ring, rectangular-shaped bracket and backplate for concealed attachment, satin finish.

2.6 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 - 1. Drying rod: Stainless steel, 1/4 inch diameter.
 - 2. Hooks: 2, 0.06 inch stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
 - 4. Length: Manufacturer's standard length for number of holders/hooks.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

END OF SECTION

SECTION 103050
MANUFACTURED FIREPLACES

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within the Conditions of the Contract and Division 01 - General Requirements are collectively applicable to this Section.
- 1.2 SCOPE
 - A. Provide manufactured wood burning fireplaces including flues, terminations, and outside air kit.
- 1.3 SUBMITTALS
 - A. Submit shop drawings showing required clearances, product data and technical literature for all products proposed for use in accordance with Section 013000.
- 1.4 COORDINATION
 - A. Coordinate work of this Section with that of related carpentry and sheet metal trades.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - 1. Astria; Georgian 50.
 - B. Substitutions: Submit in accordance with Section 016000.
- 2.2 PRODUCTS
 - A. Fireplace Style: Single sided metal-lined manufactured fireplace with engineered masonry interior lining.
 - B. Damper: Manufacturer's standard sheet steel.
 - C. Outside Air Kit: Provide constant flow of outside combustion air to the firebox.
 - D. Chimney Cap: As indicated on Drawings.

PART 3 - EXECUTION

- 3.1 PREPARATION
 - A. Verify substrate framing, surfaces and openings are ready to receive work of this Section. Notify Architect and Owner of conditions which will adversely affect execution.
 - B. Field-verify dimensions for proper rough-in.
- 3.2 INSTALLATION
 - A. Install in strict accordance with manufacturer's printed instructions. Use competent, trained workmen.
 - B. Ensure that combustible materials and overhangs/mantles are outside of the manufacturer's recommended distance from gas burning appliances.

END OF SECTION

SECTION 104400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, and wall bracket mounted measurements.
- C. Product Data: Provide extinguisher operational features and anchorage details.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.3 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. Ansul, Inc : www.ansul.com.
 - 2. JL Industries, Inc: www.jlindustries.com.
 - 3. Pyro-Chem : www.pyrochem.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. JL Industries, Inc : www.jlindustries.com.
 - 2. Larsen's Manufacturing Co : www.larsensmfg.com.
 - 3. Potter-Roemer : www.potterroemer.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.2 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by UL for the purpose specified and indicated.
- B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
 - 1. Class: A:B:C.
 - 2. Size: 10 pound.
 - 3. Finish: Baked polyester powder coat, color as selected.

2.3 FIRE EXTINGUISHER CABINETS

- A. Metal: Formed prefinished sheet steel, 0.036 inch (0.9mm) thick.
- B. Cabinet Configuration: Semi-recessed type.
 - 1. Sized to accommodate accessories.
 - 2. Trim: Returned to wall surface, with 2-1/2 inch projection.
- C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
- D. Door Glazing: Glass, clear, 1/8 inch thick float. Set in resilient channel gasket glazing.
- E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- F. Weld, fill, and grind components smooth.
- G. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected.
- H. Finish of Cabinet Interior: White enamel.

2.4 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, from finished floor to height as needed to meet accessibility requirements.
- C. Secure rigidly in place.
- D. Place extinguishers and accessories in cabinets.

END OF SECTION

SECTION 105523

MAIL BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Multiple mail boxes with hinged and locked doors.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for components.
- C. Shop Drawings: Indicate locations, construction and anchorage details, dimensions, rough-in openings sizes, quantity and arrangement of box sizes.
 - 1. Show field measurements on shop drawings.
- D. Manufacturer's Instructions: Include installation procedures, special considerations, and maintenance information.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Mail Boxes:
 - 1. Auth-Florence Manufacturing Company: www.authflorence.com.
 - 2. Bommer Industries, Inc: www.bommer.com.
 - 3. Salsbury Industries: www.mailboxes.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.2 MAIL BOXES SERVED BY U.S. POSTAL SERVICE

- A. Comply with U.S. Postal Service Standard 4C.
- B. Box Sizes: As indicated on drawings.

2.3 COMPONENTS

- A. Front Loading Panel Frame:
 - 1. Aluminum with mill finish.
 - 2. Edges beveled, piano hinged jamb, prepared for Post Office lock cylinder.
- B. Box Door:
 - 1. Plastic label installed to rear face.
 - 2. Edges beveled, piano hinged jamb, prepared for lock cylinder.
- C. Box Construction: Sheet steel, zinc coated, 22 gage thick, fabricated into modular stackable units, baked enamel flat black finish. Pre-punch bolt holes in box for stack bolting to each other and anchoring to adjacent construction; label plates for identifying each box.
- D. Box Sizes: Configured as indicated on Drawings.
- E. Postal Box Locks: Five pin tumbler lock cylinder, two keys per box, cylinders master keyed to group with two master keys.
- F. "Out-Going Mail" Lock Box: Face plate to match front loading panel frame, box of galvanized steel construction, lockable with cylinder provided by Post Office, with bag hooks for rear unloading.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that prepared openings are ready to receive work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and U.S. Postal Service regulations.
- B. Install and secure boxes in position, neatly, and accurately stacked.
- C. Install doors and adjust to operate smoothly.

END OF SECTION

SECTION 105623
WIRE STORAGE SHELVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted wire closet shelving.
- B. Accessories.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, with installation instructions.
- C. Shop Drawings: Provide drawings prepared specifically for this project; show dimensions of shelving and attachment to substrates.
- D. Selection Samples: For each color selection required, submit color chips representing manufacturer's full range of available colors and finish.

1.3 QUALITY ASSURANCE

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

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.
- C. Store flat to prevent warpage and bending.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Wire Storage Shelving:
 - 1. ClosetMaid Corporation: www.closetmaid.com.
 - 2. RubberMaid Closet and Organization Products: www.rubbermaidcloset.com.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.2 SHELVING APPLICATIONS

- A. Shelf Depth: 12 inches, unless otherwise indicated.
- B. Master Bedroom Closets:
 - 1. Shelving equipped with free sliding hanger rod
- C. Coat Closets:
 - 1. Wall-to-wall shelf with integral hanger rod.

2.3 MATERIALS

- A. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with all components and connections required to produce a rigid structure that is free of buckling and warping.
 - 1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
 - 2. Coating: PVC or epoxy, applied after fabrication, covering all surfaces.
 - 3. PVC Coating: 9 to 11 mils thick.
 - 4. Epoxy Coating: Non-toxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
 - 5. Standard Mesh Shelves: Cross deck wires spaced at 1 inch.
 - 6. Shelf and Rod Units: Integral hanging rod at front edge of shelf.
 - 7. Free-Sliding Hanging Rod: Integral hanging rod that permits uninterrupted sliding of hangers the full width of the shelf.
- B. Mounting Hardware: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.
- C. Fasteners: As recommended by manufacturer for mounting substrates.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect areas to receive shelving, to verify that spaces are properly prepared to receive shelf units, and are of dimensions indicated on shop drawings.
- B. Verify appropriate fastening hardware.
- C. Do not begin installation until substrates have been properly prepared.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, with shelf surfaces level.
- B. Cap exposed ends of cut wires.
- C. Install back clips, end clips at side walls, and support braces at open ends. Install intermediate support braces as recommended by manufacturer.

3.4 CLEANING

- A. Clean soiled surfaces after installation.

3.5 PROTECTION

- A. Protect installed work from damage.
- B. Touch-up, repair, or replace damaged products before Substantial Completion in a manner that eliminates evidence of replacement.

END OF SECTION

SECTION 107323

PREFABRICATED CARPORT CANOPY

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established in General and Supplementary Conditions of the Contract, Division 01 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 WORK INCLUDED
 - A. Pre-engineered and shop fabricated structural canopy for carports.
- 1.3 DESIGN CRITERIA
 - A. Members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable building code.
 - B. System to withstand imposed loads with maximum allowable deflection of span: 1/180.
 - C. Size and fabricate members free of distortion or defects detrimental to appearance or performance.
- 1.4 SUBMITTALS
 - A. Submit shop drawings and product data under provisions of Section 013000.
 - B. Indicate profiles, sizes, spacing and locations of structural members, decking, connections, attachments and fasteners.
 - C. Submit manufacturer's installation instructions under provisions of Section 013000.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
 - A. American Pre-fabricated Structures Inc., 800-394-1911.
 - B. Gort Metals Corporation.
 - C. Metal Construction Materials, 713-550-8383.
 - D. National Carport, 903-892-1896.
 - E. Substitutions: Under provisions of Section 016000.
- 2.2 MATERIALS
 - A. Structural Members: ASTM A 446 Grade D, galvanized sheet steel, formed to manufacturer's standard shapes, sizes, and thicknesses.
 - B. Decking: ASTM A 446, grade D or E, galvanized sheet steel, G90 zinc coating per ASTM A 525, smooth finish; gage and profile as standard with manufacturer for spans encountered.
 - C. Sealants and Gaskets: Manufacturer's standard type suitable for use with installation of metal canopy; non-staining; skinning, non-shrinking and non-sagging; ultra-violet and ozone resistant for exterior applications; color to match exposed metal.
 - D. Fasteners: Manufacturer's standard type to suit applications; with soft neoprene washers; galvanized in accordance with ASTM A 153; finished to match metal panels where exposed.
 - E. Trim, Closure Pieces, and Accessories: Same material, gage, and where exposed, of same finish as metal panels, brake formed to required profiles.
 - F. Touch-up Paint: As recommended by manufacturer.
- 2.3 COMPONENT FABRICATION
 - A. Fabricate members in accordance with manufacturer's standard profiles.
 - B. Structure: Sizes as required to support loads.
 - C. Uniformly dimension and form members to exact lengths to avoid field cutting.
 - D. Fabrication of component profiles on site not permitted.
 - E. Fabricate carports with single post, cantilevered design.
- 2.4 FINISH
 - A. Framing Members: Bare galvanized.
 - B. Deck Members: Manufacturer's standard baked-on enamel coating, with minimum 10 year warranty for color retention and finish degradation.

PART 3 - EXECUTION

3.1 ERECTION

- A. Construct concrete footing in accordance with manufacturer's engineered drawings.
- B. Erect all components in accordance with manufacturer's recommendations.
- C. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- D. Do not field cut or alter structural members without approval of Architect.
- E. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- F. Fasten decking system to structural supports, aligned plumb and sloped to drain.
- G. Securely fasten decking side laps.
- H. System: Free of rattles, noise due to thermal movement, and wind whistles.

3.2 TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.

END OF SECTION

SECTION 109900
MISCELLANEOUS SPECIALTIES

PART 1 GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established within the Owner Contractor Agreement, Instruction to Bidders, Supplemental Conditions, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Section Includes: Miscellaneous specialty items as listed herein.
- 1.3 SUBMITTALS
 - A. General: Submit following items in accordance with Section 01 3300.
 - B. Product Data: Including all pertinent performance characteristics and criteria.
 - C. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, and installation details.
 - D. Manufacturer's Instructions: For installation, maintenance, and repair.
- 1.4 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products in accordance with Section 01 6000.

PART 2 PRODUCTS

- 2.1 PRODUCTS
 - A. Fire Control Key Box: Provide recessed fire department key control box, equal to model 3200 by Knox Box.
 - 1. Provide Knox Locks as required by local fire department.
 - B. Rent Drop Box: Protex WDS-311-DD Through-Wall 2-Door Locking Drop Box

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that surfaces and conditions are ready to receive work of this Section.
 - B. Notify Architect of any existing conditions which will adversely affect execution.
 - C. Beginning of execution will constitute acceptance of existing conditions.
- 3.2 PREPARATION
 - A. Prepare substrate surfaces as recommended by manufacturer.
- 3.3 INSTALLATION
 - A. Install using skilled workmen in accordance with manufacturer's printed instructions and recommendations.
- 3.4 ADJUSTING
 - A. Adjust and fit items to be flush with adjacent construction.
 - B. Fasten or adhere for tight connections and joints.
- 3.5 CLEANING
 - A. Perform final cleaning in accordance with Division 01 Section "Closeout Procedures".
- 3.6 PROTECTION
 - A. Protect finished installation in accordance with Division 01 Section "Product Requirements".

END OF SECTION

SECTION 113100
RESIDENTIAL APPLIANCES

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Kitchen appliances.
- 1.2 REFERENCE STANDARDS
 - A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc., current edition.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
 - C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- 1.4 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
 - B. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.
- 1.5 WARRANTY
 - A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
 - B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
 - C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
 - D. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

- 2.1 KITCHEN APPLIANCES
 - A. All Equipment Eligible for Energy Star Rating: Energy Star Rated.
 - B. Refer to Standard and Premium Apartment Finish Schedules on architectural Drawings.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify utility rough-ins are present and correctly located.
- 3.2 INSTALLATION
 - A. Install in accordance with manufacturer's instructions.
 - B. Anchor built-in equipment in place.
- 3.3 ADJUSTING
 - A. Adjust operating equipment to efficient operation.
- 3.4 CLEANING
 - A. Remove packing materials from equipment.
 - B. Wash and clean equipment.

END OF SECTION

SECTION 114530

RETRACTABLE STAIRS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Provisions established in General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
 - A. Retractable, disappearing stairways.
- 1.3 SUBMITTALS
 - A. General: Submit following items in accordance with Section 013300.
 - B. Product Data: Including all pertinent performance characteristics and criteria.
 - C. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, and installation details.
- 1.4 DELIVERY, STORAGE AND HANDLING
 - A. Deliver, store, handle, and protect products in accordance with Section 01600.

PART 2 - PRODUCTS

- 2.1 RETRACTABLE STAIRS
 - A. Standard wood disappearing stair.
 - 1. Treads: Beveled both edges and grooved on face, 1 inch by 6 inch minimum.
 - 2. Hinge: Full width piano type.
 - 3. Door panel: Insulated minimum R-6.
 - 4. Fully rodded ladder sections.
 - 5. Fasteners: Plated.
 - 6. Handrail: Wood.
 - 7. Load Capacity: 300 pounds minimum.
 - 8. Width: 20 inches out to out of stringers.
 - B. Acceptable Manufacturer:
 - 1. Bessler Stairway Company.
 - C. Substitutions: Submit in accordance with Section 012500.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Verify that surfaces and conditions are ready to receive work of this Section.
 - B. Notify Architect of any existing conditions which will adversely affect execution.
 - C. Beginning of execution will constitute acceptance of existing conditions.
- 3.2 PREPARATION
 - A. Prepare substrate surfaces as recommended by manufacturer.
- 3.3 INSTALLATION
 - A. Install using skilled workmen in accordance with manufacturer's printed instructions and recommendations.
- 3.4 ADJUSTING/CLEANING
 - A. Adjust and fit items to be flush with adjacent construction.
 - B. Fasten or adhere for tight connections and joints.

END OF SECTION

SECTION 122113

HORIZONTAL LOUVER BLINDS – SIMULATED WOOD

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Horizontal slat louver blinds.
- B. Operating hardware.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics.
- C. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Horizontal Louver Blinds:
 - 1. Hunter Douglas: www.hunterdouglas.com.
 - 2. Levolor Contract: www.levolorcontract.com.
 - 3. Graber, division of Springs Window Fashions: www.graberblinds.com.
 - 4. Bali Blinds.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.2 BLINDS AND BLIND COMPONENTS

- A. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.
- B. Plastic Slats: PVC foam, radiused slat corners.
 - 1. Width: 2 inch.
 - 2. Color: As selected by interior designer.
 - 3. Texture: Smooth.
- C. Slat Support: Woven polypropylene cord, ladder configuration.
- D. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats
- E. Bottom Rail: Pre-finished, formed PVC with top side shaped to match slat curvature; with end caps.
Color: Same as headrail.
- F. Lift Cord: Braided nylon; continuous loop.
- G. Control Wand: Extruded hollow plastic; hexagonal shape.
- H. Headrail Attachment: Wall brackets.
- I. Accessory Hardware: Type recommended by blind manufacturer.

2.3 FABRICATION

- A. Determine sizes by field measurement.
- B. Fabricate blinds to fit within openings with uniform edge clearance of 1/8 inch.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings are ready to receive the work.
- B. Ensure structural blocking and supports are correctly placed.

3.2 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with flush countersunk fasteners.

3.3 INSTALLATION TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

3.4 ADJUSTING

- A. Adjust blinds for smooth operation.

3.5 CLEANING

- A. Clean blind surfaces just prior to occupancy.

END OF SECTION

SECTION 122116

VERTICAL LOUVER BLINDS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Vertical louver blinds with aluminum vanes.
 - 2. Motorized operators.
- 1.3 ACTION SUBMITTALS
 - A. Product Data: For each type of product.
 - B. Shop Drawings: Show fabrication and installation details for vertical louver blinds.
 - C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.
- 1.4 CLOSEOUT SUBMITTALS
 - A. Maintenance Data: For vertical louver blinds to include in maintenance manuals.
- 1.5 MAINTENANCE MATERIAL SUBMITTALS
 - A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Vanes: Furnish quantity of full-size units equal to 2 percent of quantity installed for each type, size, texture, pattern.
- 1.6 QUALITY ASSURANCE
 - A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver vertical louver blinds in factory packages, marked with manufacturer and product name, and location of installation using same designations indicated on Drawings.
- 1.8 FIELD CONDITIONS
 - A. Environmental Limitations: Do not install vertical louver blinds until construction and wet and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - B. Field Measurements: Where vertical louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 VERTICAL LOUVER BLINDS, ALUMINUM VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Hunter Douglas Contract.
- B. Vanes: Aluminum, alloy, and temper recommended by producer for type of use and finish indicated; with crowned profile and not less than 3/8-inch (9.5-mm) overlap when rotated fully closed.
 - 1. Width: 3-1/2 inches (89 mm).
- C. Headrail: Channel, extruded aluminum with long edges returned or rolled and ends capped. Headrail encloses operating mechanisms including carrier-spacing mechanism that provides uniform vane spacing when blinds are traversed fully across headrail (closed).
 - 1. Manual Traverse Control: Nickel-plated metal bead chain.
 - 2. Manual Rotation Control: Nickel-plated metal bead chain.
 - 3. Manual Control Locations: Right.
 - 4. Draw and Stack: One way, stack left.
- D. Carriers: Engineered plastic with gears to align and synchronize vane rotation and stems that allow vane removal and replacement. Lead carriers have self-lubricating wheels or elongated bearing surfaces; following carriers have self-lubricating wheels.
- E. Valance: Manufacturer's standard with vane insert.
- F. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
 - 1. Type: Wall.
 - 2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- G. Colors, Textures, and Patterns:
 - 1. Vanes: Refer to Finish Legend.
 - 2. Components: Provide materials exposed to view matching or coordinating with vanes unless otherwise indicated.

2.2 VERTICAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate vertical louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to cover window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
- C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
 - 1. Rotation-and-Traverse Mechanisms: With permanently lubricated moving parts.
- D. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, valance, and operating hardware and for bracket positions and blind mounting method indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish: For metal components exposed to view unless anodized or plated finish is indicated. Apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install vertical louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Locate so exterior vane edges are not closer than 1 inch from interior faces of glass.
 - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

- A. Adjust vertical louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

- A. Clean vertical louver blind surfaces after installation according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer and that ensures that vertical louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged vertical louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

END OF SECTION

SECTION 123530
RESIDENTIAL CASEWORK

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Kitchen cabinets.
 - B. Vanity cabinets.
 - C. Casework hardware.

- 1.2 REFERENCE STANDARDS
 - A. ANSI/KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; Kitchen Cabinet Manufacturers Association ; 2000 (R2006).
 - B. KCMA (DIR) - Directory of Certified Cabinet Manufacturers; Kitchen Cabinet Manufacturers Association ; current edition, online.

- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide component dimensions and construction details.
 - C. Shop Drawings: Indicate casework locations, large scale plans, elevations, clearances required, rough-in and anchor placement dimensions and tolerances .
 - D. Samples: Submit two samples illustrating each color and finish.

- 1.4 QUALITY ASSURANCE
 - A. Products: Complying with KCMA A161.1 and KCMA Certified.
 - B. Manufacturer: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

- 1.5 MOCK-UP
 - A. Provide full size mock-up of casework base unit and upper cabinet.
 - B. Locate where directed.
 - C. Mock-up may remain as part of the Work.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Residential Casework:
 - 1. Kraftmaid Cabinetry, Inc.
 - 2. Wellborn Cabinet, Inc
 - 3. Armstrong.
 - 4. Triangle Pacific.
 - 5. Republic Cabinets.
 - 6. Leedo Manufacturing.
 - 7. Master Wood Craft.
 - 8. Substitutions: See Section 016000 - Product Requirements.

- 2.2 COMPONENTS
 - A. Cabinet Construction: Softwood lumber framing and particle board, tempered hardboard gables.
 - B. Countertops: As specified in Section 123600.
 - C. Door and Drawer Fronts: Solid hardwood; Shaker style.
 - D. Face Frame: Solid hardwood.
 - E. Bolts, Nuts, Washers and Screws: Of size and type to suit application.
 - F. Concealed Joint Fasteners: Threaded steel.
 - G. Acceptable Products: As selected by Architect.

2.3 HARDWARE

- A. Hardware: Manufacturer's standard.
- B. Hinges: Self closing, concealed style, manufacturer's standard.
- C. Drawer Guides: Side mounted, epoxy coated, 75 pound capacity.
- D. Pulls: Back of door and drawer edging routed for finger pull on top of drawers and base cabinet doors, and bottom of wall cabinet doors.

2.4 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
- C. Fabricate each unit to be rigid and not dependent on building structure for rigidity.
- D. Form smooth edges. Form material for facing, shelves, and drain boards from continuous sheets.

2.5 FINISHES

- A. Exposed To View Surfaces: Stain, seal, and finish of color as selected.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of support framing.

3.2 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Use filler strips; not additional overlay trim for this purpose.
- E. Close ends of units, back splashes, shelves and bases.

3.3 ADJUSTING

- A. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly.

3.4 CLEANING

- A. Clean casework, countertops, shelves, and hardware.

3.5 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.

END OF SECTION

SECTION 123600

COUNTERTOPS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Countertops for architectural cabinetwork.
- B. Countertops for manufactured casework.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- B. Installer Qualifications: Fabricator.
- C. Owner to hand select counter top slabs for rec/leasing building.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

- A. Natural Stone Countertops: Stone slabs bonded to substrate; use as large pieces as possible with inconspicuous adhesive joints.
 - 1. Stone: Granite without cracks, voids, or pin holes; filling with matching epoxy resin is acceptable.
 - 2. Stone Thickness: 2 cm.
 - 3. Surface Finish: Polished.
 - 4. Exposed Edge Treatment: Refer to Drawings.
 - 5. Back and End Splashes: Same material, same thickness; for field attachment.
 - 6. Acceptable Product: Refer to Finish Legend.

2.2 ACCESSORY MATERIALS

- A. Plywood for Supporting Substrate (stone): PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Joint Sealant: Mildew-resistant silicone sealant, white.

2.3 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Seal joint between back/end splashes and vertical surfaces.
 - 1. Where indicated use rubber cove molding.
 - 2. Where applied cove molding is not indicated use specified sealant.

3.4 CLEANING

- A. Clean countertops surfaces thoroughly.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 311000
SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Clearing and protection of vegetation.
- B. Removal of existing debris.

1.3 SUBMITTALS

- A. See Section 013100 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 - 1. Vegetation removal limits.
 - 2. Areas for temporary construction and field offices.

1.4 QUALITY ASSURANCE

- A. Clearing Firm: Company specializing in the type of work required.
 - 1. Minimum of three years of documented experience.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fill Material: Refer Civil and Structural documents.

PART 3 EXECUTION

3.1 SITE CLEARING

- A. Comply with other requirements specified in Section 017000.
- B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.2 EXISTING UTILITIES AND BUILT ELEMENTS

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Protect existing structures and other elements that are not to be removed.

3.3 VEGETATION

- A. Do not remove or damage vegetation beyond the following limits:
 - 1. 40 feet outside the building perimeter.
 - 2. 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
 - 3. 15 feet each side of roadway curbs and main utility trenches.
 - 4. 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
- B. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
 - 1. At vegetation removal limits.
- C. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.
- D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
 - 1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
 - 2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
 - 3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
- E. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.4 DEBRIS

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 312000

EARTHWORK

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- A. Provisions established within General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- 1.2 SECTION INCLUDES
- A. Provide complete earthwork including:
1. Removing and hauling off topsoil.
 2. General excavation, excavation for structures and footings.
 3. Rough grading
 4. Fill and backfill
 5. Finish grading.
 6. Shoring and bracing excavations with temporary shoring, sheeting or retention system as required by code law or ordinance to protect excavation area, workers, nearby streets and structures.
- B. Note: Refer to the soils investigation report and to recommendations of the soils engineer. If anything contained herein is contradictory to such report or recommendations, the report and recommendations of the soils engineer shall govern.
- 1.3 SUBMITTALS
- A. Samples: Submit data on each type of fill material to be used as requested by Civil Engineer and Owner.
- 1.4 BASIS FOR BIDS
- A. Bids shall be based on excavating and filling with materials encountered at site except where special fill or backfill materials are specified herein or indicated on Drawings. No allowance or extra payments will be made by reason of variation in types of soil encountered or variations in their moisture contents.
- 1.5 QUALITY ASSURANCE
- A. Shoring, sheeting, bracing and retention plans, details and other provisions necessary in order to safely excavate trenches for this project shall be prepared by a Professional Engineer registered in the State where the project is constructed and employed by Contractor. The Contractor shall be solely responsible for retention plans, details, accessories and execution.
- 1.6 PROTECTION
- A. Protect trees, shrubs, lawns, rock outcroppings and other features remaining as a portion of final landscaping.
- B. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from equipment and vehicular traffic.
- C. Protect above and below grade utilities which are to remain.
- D. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation. Monitor shoring system and surrounding ground surface during construction to detect movement. If movement becomes significant, take contingency steps to brace excavation and adjacent utility lines.
- E. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
- F. Notify Architect and Owner of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- G. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- H. Grade excavation top perimeter to prevent surface water run-off into excavation.
- 1.7 COORDINATION
- A. Coordinate excavation work with other trades for proper scheduling of work. Accurately record location of utilities to remain prior to beginning work, including horizontal dimensions, inverts and slope gradients.
- 1.8 TESTING
- A. Will be performed in accordance with the provisions of Section 014000.

- 1.9 PROJECT RECORD DOCUMENTS
A. Submit under provisions of Section 017800.

PART 2 - PRODUCTS

- 2.1 STOCKPILING
A. Material cut or excavated from building areas which is suitable for backfilling may be stored on site to be distributed later. Fill material required to be hauled in may be stockpiled at site until used, provided it is properly handled to prevent contamination with undesirable materials. Stockpile topsoil separate from excavated sub-soil.
- 2.2 SURPLUS MATERIALS
A. Excavated materials not to be used in fills and backfills on this project shall be removed from site immediately. Materials containing rubbish, debris or rocks shall be removed.
- 2.3 MATERIALS
A. General Fill and Backfill: Suitable existing excavated on-site soil free from vegetation, debris, and other deleterious matter, unless otherwise noted.
B. Fill Beneath Structures: Inert and non-expansive, having a plasticity index, liquid limit, and other characteristics in accordance with the soil investigation report.
C. Top Soil
1. Clean natural topsoil free of vegetation, debris and other deleterious matter.
2. Provide topsoil free from weeds, nutgrass, lumps, stones larger than 1 inch, roots, or similar substances.
- 2.4 SHORING AND BRACING
A. Contractor shall design and provide as necessary to prevent cave-ins and slides, or as a protection for workmen in trenches and other excavation. Shoring and bracing shall remain in place as long as required for safety and shall be removed only as backfill is placed. Comply with all Municipal, State, and Federal requirements.

PART 3 - EXECUTION

- 3.1 EXAMINATION
A. Establish extent of excavation by area and elevation; designate and identify datum elevation.
B. Set required lines and levels.
C. Maintain bench marks, monuments and other reference points.
- 3.2 PREPARATION
A. Before starting excavation, establish location and extent of underground utilities occurring in work area.
B. Notify utility companies to remove and relocate lines which are in way of excavation.
C. Maintain, reroute or extend as required, existing utility lines to remain which pass through work area.
D. Protect utility services uncovered by excavation.
E. Remove abandoned utility service lines from areas of excavation; cap, plug or seal such lines and identify at grade.
F. Accurately locate and record abandoned and active utility lines rerouted or extended on Project Record Documents.
G. Upon discovery of unknown utility or concealed condition, discontinue affected work and notify Architect and Owner.
- 3.3 ROUGH GRADING
A. Excavation and rough grade to lines and grades shown.
B. Overcut new planting and lawn areas to allow a layer of topsoil not less than 4" thick.
C. Maintain excavations to drain and be free of excess water.
D. Remove objectionable and excess materials from site when excavated.

3.4 STRUCTURAL EXCAVATION

- A. Locate and mark all existing underground utilities and services before beginning structural excavation.
- B. Provide excavation for structures and footings, as required for construction, bracing and removal of forms, applying waterproofing, and to permit inspection.
- C. Machine slope banks to angle of repose or less until shored. Excavation shall not interfere with normal 45 degree angle bearing splay of any foundation.
- D. Bottom of excavating shall be reasonably level.
- E. Maintain excavations in as near their natural moisture conditions as possible.
- F. Fill over-excavated areas under structure bearing surfaces in accordance with Soil Engineer's direction.
- G. Do not allow construction equipment to create "pumping" of soils.
- H. Stockpile excavated clean fill for reuse where directed. Remove excess or unsuitable excavated fill from site.
- I. Remove boulders or cobbles. Use of explosives will not be permitted.
- J. Coordinate with drilled pier work for special requirements and arrangements regarding excavation to rough out elevations.
- K. If presence of perched water is encountered, provide interior drainage.

3.5 EXCAVATION BENEATH FLOOR SLABS

- A. Beneath Floor Slab on Grade: Refer to recommendations of the soils engineer.

3.6 FILLS AND BACKFILLS - GENERAL

- A. Verify areas to be backfilled are free of debris, snow, ice or water, and ground surfaces are not frozen.
- B. Proofroll exposed subgrade in building and paving areas to detect unsuitable soil conditions. Commence proofrolling operations after a suitable period of dry weather to avoid degrading acceptable subgrade surfaces. Make four passes over each section with proofrolling equipment, with the last two perpendicular to the first two.
- C. Cut out soft areas of subgrade not readily capable of in- situ compaction. Backfill and compact to density equal to requirements for subsequent backfill material.
- D. Site backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet or spongy subgrade surfaces.
- E. Use a placement method that will not disturb or damage utilities in trenches.
- F. Maintain optimum moisture content of backfill materials to attain required compaction density.
- G. Make gradual changes in grade. Blend slopes into level areas.
- H. Refer to soils investigation report for additional requirements.

3.7 FILLS (WITHIN STRUCTURE)

- A. Select Fill Beneath Slabs on Grade: (refer to soils report for specific fill placement criteria)
 - 1. Scarify exposed sub-grade and recompact to an appropriate density determined using Standard Proctor Compaction Test, at moisture content as indicated in soil report.
 - 2. Place appropriate fill in loose lifts and compact each lift to an appropriate density determined using Standard Proctor Compaction Test, at moisture content as indicated in soil report.
 - 3. Place select fill to a minimum depth indicated on drawings.
 - 4. Prevent excessive loss of moisture during construction.
- B. Refer to soils investigation report for additional requirements.

3.8 FILLS (OUTSIDE STRUCTURE)

- A. Roughen and loosen filled areas before placing of fill materials.
- B. Spread suitable fill materials in uniform layers over area not to exceed 8" thick compaction.
- C. Wet and work materials as required for proper compaction and thoroughly mix. Compaction shall be by tamping rollers or by utilizing excavation equipment to spread and compact fill to a uniform density equal to natural density of material before excavating.
- D. Areas adjacent to building, or where compacting equipment cannot work, shall be compacted with hand tampers.
- E. Scarify upper 6 inches of exposed sub-grade and compact filled areas to density as indicated in the soils report, to lines and grades shown, with allowances for a final layer of topsoil at least 4 inches thick in lawn and planter areas.
- F. Plant Beds: Refer to landscape drawings. Beds shall be prepared to a minimum of 4 inches of depth.

- 3.9 BACKFILL (OUTSIDE STRUCTURE)
- A. Ensure areas to be backfilled are free from debris, snow, ice and water and that ground surfaces are not in frozen condition.
 - B. Do not backfill over existing subgrade surfaces which are porous, wet or spongy.
 - C. Backfill areas to grades, contours, levels and elevations indicated.
 - D. Backfill systematically and as early as possible to allow maximum time for natural settlement and compaction.
 - E. After permanent construction is in place, forms and trash removed, sub-soil drainage and water-proofing complete and inspections complete, backfill with approved materials and compact to approximate density of natural ground.
 - F. Place backfill in layers not exceeding 8" loose depth, and hand or machine tamp to compaction required.
 - G. Water may be added to backfill material as an aid to compaction; however, material shall not be wet to form a mud or paste.
- 3.10 REMOVAL OF CONTAMINATED SOIL
- A. Prior to finish grading: Soil contaminated with lime should be removed from lawn and plant bed areas. Replace with clean, approved topsoil.
- 3.11 FINISH GRADING
- A. After rough grading has been completed and site cleared of construction debris, cover areas disturbed by construction or graded to provide new finish grades with a layer of topsoil not less than 4" thick.
 - B. Reuse stockpiled topsoil, cleaned of foreign matter, or provide additional approved topsoil as required.
 - C. Final grades shall be as shown or as directed by Landscape Architect and shall slope away from building and shall provide drainage for area.
 - D. Degree of finish shall be that ordinarily obtainable with blade grader or scraper operations.
 - E. Finish surfaces shall be not be more than 0.10 feet above or below established grade elevation.
 - F. Provide uniform roundings at top and bottom of slopes and other breaks in grade. Correct irregularities and areas where water will stand.
 - G. Uniformly distribute topsoil to required grades; feather back to where grades remain unchanged.
 - H. Finish lawn and unpaved areas to 1" below top of walk and curbs.
- 3.12 PROTECTION, CLEAN-UP AND EXCESS MATERIALS
- A. Protect grades from construction and weather damage, washing, erosion and rutting, and repair such damage that occurs.
 - B. Correct any settlement below established grades to prevent ponding of water.
 - C. At locations where lime, concrete or other foreign matter has penetrated or been mixed with earth, remove damaged earth and replace with clean material.
 - D. Remove excess stockpiled material, debris, waste, and other material from site and leave work in clean finished condition for final acceptance. Contractor is responsible for disposal of debris and excess materials.
- 3.13 QUALITY CONTROL
- A. Paving Subgrade Stabilization: Perform one subgrade in-place density test per 7,500 S.F. of subgrade, after subgrade preparation is complete at locations determined by the soils engineer, in accordance with ASTM D2922 and ASTM D3017. Perform tests within 48 hours of placement of pavement construction.
 - B. Building Subgrade Stabilization: Make necessary soil tests (Atterberg Limit Series and ASTM D698 Standard Proctor for each type of fill specified) to determine the moisture content and density of existing subgrade and inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D2922) for each 5,000 S.F. of area within the building footprint on each lift prior to placement of additional fill material.

END OF SECTION

SECTION 313116
TERMITE CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Chemical soil treatment.

1.2 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.
- C. Test Reports: Indicate regulatory agency approval reports when required.
- D. Manufacturer's Application Instructions: Indicate caution requirements .
- E. Manufacturer's Certificate: Certify that toxicants meet or exceed specified requirements.
- F. Certificate of compliance from authority having jurisdiction indicating approval of toxicants.
- G. Record moisture content of soil before application.
- H. Maintenance Data: Indicate re-treatment schedule .
- I. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing this type of work and:
 - 1. Having minimum of 2 years documented experience.
 - 2. Approved by manufacturer of treatment materials.
 - 3. Licensed in the State in which the Project is located.

1.4 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year installer's warranty against damage to building caused by termites.
 - 1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.
 - 2. Inspect annually and report in writing to Owner. Provide inspection service for [1 (one)] years from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Manufacturers:
 - 1. Bayer Environmental Science Corp : www.backedbybayer.com/pest-management.
 - 2. FMC Professional Solutions : www.fmcprosolutions.com.
 - 3. Syngenta Professional Products : www.syngentaprofessionalproducts.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.
- C. Diluent: Recommended by toxicant manufacturer.

2.2 MIXES

- A. Mix toxicant to manufacturer's instructions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.
- B. Verify final grading is complete.

3.2 APPLICATION

- 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.
- D. Under slabs, apply toxicant immediately prior to installation of vapor barrier.
- E. At foundation walls, apply toxicant immediately 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.

3.3 PROTECTION

- A. Do not permit soil grading over treated work.

END OF SECTION

SECTION 321313

CONCRETE PAVING

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Concrete sidewalks, stair steps, integral curbs, gutters, parking areas, and roads.
- 1.2 PERFORMANCE REQUIREMENTS
 - A. Design paving for parking, light duty commercial vehicles, and movement of trucks up to 60,000 lbs.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on joint filler, admixtures, and curing compound.
 - C. Design Data: Indicate pavement thickness, designed concrete strength, reinforcement, and typical details.
- 1.4 QUALITY ASSURANCE
 - A. Perform work in accordance with ACI 301.
 - B. Follow recommendations of ACI 305R when concreting during hot weather.
 - C. Follow recommendations of ACI 306R when concreting during cold weather.
- 1.5 ENVIRONMENTAL REQUIREMENTS
 - A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

- 2.1 FORM MATERIALS
 - A. Form Materials: Conform to ACI 301.
 - B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D 1751) or sponge rubber or cork (ASTM D 1752).
- 2.2 STEEL REINFORCEMENT
 - A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
 - B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60Grade 420; deformed.
 - C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
- 2.3 CONCRETE MATERIALS
 - A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, gray portland cement Type I.
 - a. Fly Ash: ASTM C 618, Class C or Class F.
 - D. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: 1-1/2 inches38 mm nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
 - E. Water: Potable and complying with ASTM C 94/C 94M.
 - F. Air-Entraining Admixture: ASTM C 260.
 - G. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

2.2 ACCESSORIES

- A. Curing Compound: ASTM C 309, Type 1, Class A.
 - B. Joint Sealer: Type U-TB as specified in Section 079005.
 - C. Pigmented Mineral Dry-Shake Hardener (at HC ramps): Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, non-fading mineral oxides inter-ground with cement.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dayton Superior Corporation; Quartz Tuff.
 - b. L&M Construction Chemicals, Inc.; QUARTZPLATE FF.
 - c. Scofield, L. M. Company; LITHOCHROME Color Hardener.
- Color: As selected by Architect from manufacturer's full range.

2.3 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- D. Concrete Properties:
 - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 3,000 lbs for sidewalks; Refer to civil engineering drawings for vehicular pavement strengths.
 - 2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
 - 3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
 - 4. Water-Cement Ratio: Maximum 40 percent by weight.
 - 5. Total Air Content: 4 percent, determined in accordance with ASTM C 173/C 173M.
 - 6. Maximum Slump: 4 inches.

2.4 MIXING

- A. Transit Mixers: Comply with ASTM C 94/C 94M.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.
- C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.3 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCEMENT

- A. Place reinforcement at top of slabs-on-grade.
- B. Interrupt reinforcement at contraction joints.
- C. Place dowels to achieve pavement and curb alignment as detailed.

3.5 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.6 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 3/4 inch wide expansion joints at 60 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
 - 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
 - 2. Secure to resist movement by wet concrete.
- C. Provide scored joints:
 - 1. At 5 feet intervals in walks.
 - 2. Between sidewalks and curbs.
 - 3. Between curbs and asphaltic pavement.
- D. Provide keyed joints as indicated.
- E. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Locate at maximum 15 feet on center. Cut 1/3 into depth of slab.

3.7 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
- E. Texture and color accessible ramps to meet requirements of authorities having jurisdiction.

3.8 JOINT SEALING

- A. See Section 079005 for joint sealer requirements.

3.9 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.10 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000.
 - 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - 2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - 3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- B. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
 - 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 321713

PRECAST CONCRETE SITE ACCESSORIES

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- A. Precast concrete parking bumpers.
 - B. Precast concrete splash blocks.
 - C. Precast concrete mechanical unit support pads.
- 1.2 SUBMITTALS
- A. Product Data: Submit manufacturer's literature and installation instructions in accordance with Section 013000.
 - B. Certificates: Submit manufacturer's certification that materials meet specification requirements.

PART 2 - PRODUCTS

- 2.1 PRECAST CONCRETE WHEEL STOPS
- A. Qualities: Precast concrete wheel stops, reinforced, and having 2 pre-drilled pin holes and having 2 cast-in anchor pins.
 - 1. Concrete: Normal weight concrete, minimum 4000 psi 28-day compressive strength.
 - 2. Reinforcing: 2 continuous No. 3 deformed reinforcement bars.
 - 3. Size: 8-1/2 inch wide by 6 inch high by 72 inch length.
 - 4. Anchor Pins: 5/8 inch deformed bar, 2 for each wheel stop, extending a minimum of 3 inches below bottom of wheel stop.
 - B. Standards
 - 1. Concrete: ASTM C 94.
 - 2. Reinforcing: ASTM A 615, Grade 40.
- 2.2 PRECAST CONCRETE SPLASH BLOCKS AND MECHANICAL UNIT PADS
- A. Precast concrete, reinforced with manufacturer's standard mesh or deformed bars.
 - B. Concrete: Normal weight, minimum 4000 psi 28 day compressive strength.
 - C. Size: As indicated on Drawings.

PART 3 - EXECUTION

- 3.1 PREPARATION - WHEEL STOPS
- A. Verify layout of wheel stop locations with pavement marking layout.
 - B. Thoroughly clean surfaces to receive wheel stops free of dirt, sand, oil, grease or other foreign matter.
- 3.2 INSTALLATION - WHEEL STOPS
- A. Install a precast wheel stop at each parking space indicated on drawings.
 - B. Install wheel stops with anchors [adhesive] in accordance with manufacturer's instructions.
 - C. Leave wheel stops securely anchored and in proper alignment.
- 3.3 INSTALLATION - SPLASH BLOCKS AND MECHANICAL UNIT PADS
- A. Place blocks and pads on smooth, even topsoil. Place level and solidly supported.

END OF SECTION

SECTION 321723
PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Parking lot markings, including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.
 - B. "No Parking" curb painting.
- 1.2 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Installation methods.
- 1.3 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
 - B. Store products in manufacturer's unopened packaging until ready for installation.
 - C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- 1.4 FIELD CONDITIONS
 - A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

- 2.1 MATERIALS
 - A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
 - 1. Roadway Markings: As required by authorities having jurisdiction.
 - 2. Parking Lots: White.
 - 3. Handicapped Symbols: Blue.
 - B. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Do not begin installation until substrates have been properly prepared.
 - B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
- D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
- E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.
- F. Temporary Pavement Markings: When required or directed by Architect, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.
 - 1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.
 - 2. At Contractor's option, temporary marking tape may be used in lieu of temporary painted marking; remove unsatisfactory tape and replace with painted markings at no additional cost to Owner.

3.3 INSTALLATION

- A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
- C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- D. Comply with FHWA MUTCD manual (<http://mutcd.fhwa.dot.gov>) for details not shown.
- E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
 - 1. Apply paint in one coat only.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Width Tolerance: Plus or minus 1/8 inch.
- G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
 - 1. Mark the International Handicapped Symbol at indicated parking spaces.
 - 2. Hand application by pneumatic spray is acceptable.
- H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.4 DRYING, PROTECTION, AND REPLACEMENT

- A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
- B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
- C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
- D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
- E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
- F. Replace removed markings at no additional cost to Owner.

END OF SECTION

SECTION 323119
DECORATIVE METAL FENCES AND GATES

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Decorative steel fences and gates.
- 1.2 ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to start of work of this section; require attendance by all affected installers.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - C. Shop Drawings:
 - 1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
 - 2. Foundation details, concrete design mix and reinforcing schedule for anti-ram barrier system.
 - D. Installer's Qualification Statement.
 - E. Manufacturer's Warranty.
- 1.4 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
 - B. Installer Qualifications: Experienced with type of construction involved and materials and techniques specified.
- 1.5 DELIVERY, STORAGE AND HANDLING
 - A. Store materials in a manner to ensure proper ventilation and drainage. Protect against damage, weather, vandalism and theft.
- 1.6 WARRANTY
 - A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
 - B. Finish: 10 years.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Decorative Metal Fences:
 - 1. Ameristar Fence Products, Inc: www.ameristarfence.com.
 - 2. Substitutions: Submit in accordance with Section 016000.
- 2.2 FENCES
 - A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners;
 - 1. Capable of resisting vertical load, horizontal load and infill performance requirements for fence categories defined in ASTM F2408.
 - a. Impact Resistance: ASTM D2794; 60 inch pounds.
 - b. Weathering Resistance: ASTM D523, D 822 and D 2244; less than 60 percent loss of gloss.
 - B. Steel: ASTM A653/A653M; yield strength 45,000 psi, minimum.
 - 1. Hot-dip galvanized; A 653/A653M, G60.
 - 2. 62 percent recycled steel, minimum.

2.3 WELDED STEEL FENCE

- A. Provide fence meeting requirements for Industrial class as defined by ASTM F2408.
- B. Fence Panels: Fusion welded; 6 feet high by 6 feet long.
 - 1. Panel Style: Two rail.
 - 2. Attach panels to posts with manufacturer's standard panel brackets.
- C. Posts:
 - 1. Size: 2-1/2 inches square by 12 gage, with manufacturer's standard cap.
- D. Rails: Manufacturer's standard, double-wall steel channel 1-3/4 inch square by 12 gage with pre-punched picket holes.
 - 1. Picket Retaining Rods: 0.125 inch galvanized steel.
 - 2. Picket-to-Rail Intersection Seals: PVC grommets.
- E. Pickets: Steel tube.
 - 1. Spacing: 3-3/4 inch clear.
 - 2. Size: 1 inch square by 18 gage.
 - 3. Style: Pickets with finial extend above top rail.
 - 4. Finial: Spear point.
- F. Flexibility: Capable of following variable slope of up to 1:2.
- G. Gates: Same material as fence construction, with the following hardware:
 - 1. Hinges: One pair Ives 3SP1 spring hinges.
 - 2. Panic device: Von Duprin 99-L-F 996-F, exterior environment. Provide with level handle and credentialing device as approved by Owner.
 - 3. Weld wire welded mesh in pattern as indicated on drawings to prevent activation of panic device from outside.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set fence posts in accordance with the manufacturer recommended spacing.
- C. When cutting rails immediately seal the exposed surfaces by:
 - 1. Removing all metal shavings from cut area.
 - 2. Apply zinc-rich primer to thoroughly cover cut edge and drilled hole; allow to dry.
 - 3. Apply 2 coats of custom finish spray paint matching fence color.
 - 4. Failure to seal exposed surfaces in accordance with manufacturer's instructions will negate manufacturer's warranty.
- D. Space gate posts according to the manufacturers' drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected.
 - 1. Base type and quantity of gate hinges o the application; weight, height, and number of gate cycles.
 - 2. Identify the necessary hardware required for the application on the manufacturer's gate drawings.
 - 3. Provide gate hardware by the manufacturer of the gate and install per manufacturer's recommendations

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From Indicated Position: 1 inch.
- C. Minimum distance from property line: 6 inches..

3.5 CLEANING

- A. Leave immediate work area neat at end of each work day.
- B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- C. Clean fence with mild household detergent and clean water rinse well. .
- D. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.
- E. Touch up scratched surfaces using materials recommended by manufacturer. Match touchup paint color to fence finish.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 323136
SECURITY GATES AND OPERATORS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Security gates.
 - B. Controls and related wiring.
- 1.2 ADMINISTRATIVE REQUIREMENTS
 - A. Coordination: Coordinate installation of units with size, location and installation of service utilities.
 - B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of work of this section; require attendance by all affected installers.
 - C. Sequencing: Ensure that utility connections are completed in an orderly and expeditious manner.
- 1.3 SUBMITTALS
 - A. See Section 013000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Provide detailed drawings showing:
 - 1. Layout and overall dimensions of each major element of the barrier equipment, including the hydraulic power unit and operator control panels, if applicable.
 - 2. Foundation and anchoring requirements of the barrier equipment.
 - 3. Hydraulic schematic drawing showing size and number of hoses required to run between the barrier device and the hydraulic power unit.
 - 4. Electrical schematic including associated wiring, showing all electrically connected components, including interface points for connection to equipment; indicate minimum conduit size and number of wires required to run between each component of the barrier equipment.
 - 5. Schematic drawings of the entire barrier system, with all manufacturer supplied equipment connected and integrated.
 - C. Operation and Maintenance Data.

PART 2 PRODUCTS

- 2.1 MATERIALS/FEATURES
 - A. Sliding Type Operators: Elite model SL-3000-UL, or Sentex series 1000. Provide emergency over-ride for Fire and EMT vehicles that allow all gates to open simultaneously.
 - B. Gates: Custom fabricated of frame and pickets to match adjacent fencing.
 - C. Provide with RFID security access reader compatible with Owner furnished tenant credentialed device.
- 2.2 SECURITY GATES AND BARRIERS
 - A. Security Gates and Barriers: Factory-fabricated, -assembled, and -tested devices, including all components for satisfactory operation; capable of resisting specified impact when installed in foundations indicated on drawings.
 - B. Material: Hot-dipped galvanized steel with painted finish.
 - C. Color: As selected from manufacturer's standard.
- 2.3 VEHICLE DETECTORS
 - A. Vehicle Loop Detector System: Provide self-tuning electronic detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit signal activating gate-arm operator. Include automatic closing timer with adjustable time delay before closing and vehicle loop detector designed to hold gate arm open until traffic clears. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location shown on Drawings, as recommended in writing by detection system manufacturer for function indicated.
 - 1. Factory-Formed Loop: Wire, preformed in size indicated; style for saw-cut installation.
 - 2. System Performance: Capable of the following:
 - a. Recognize two vehicles within 6 inches of each other on standard-sized loop.
 - b. Recognize vehicle direction by detecting vehicle moving from one loop to another.
 - c. Generate reverse count if vehicle backs up after generating directional count in forward direction.
 - 1) Continuous diagnostic monitoring for intermittently operating and failed loops.

- 2) Crosstalk test between adjacent loops.
- B. Vehicle Presence Detector: Provide emitter/receiver-type detector with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of vehicle in gate-arm pathway by interrupting infrared beam in zone pattern and to emit signal activating gate-arm operator. Include automatic closing timer with adjustable time delay before closing and vehicle presence detector designed to.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Verify location of existing utilities, grades and conditions of substrate.
 - 2. Verify existing vehicle detector loops, including their size, geometry and wiring.
 - 3. Verify integration requirements with other site security equipment including but not limited to card readers, tire puncture devices, gates and other automated barrier systems.

3.2 PREPARATION

- A. Protect existing work from damage due to installation of this work.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Provide manufacturer's certified, field supervisor during key milestones of the installation of the barrier.

3.5 SYSTEM STARTUP

- A. Provide manufacturer's field representative to observe systems startup.
- B. Prepare and start equipment in accordance with manufacturers' instructions and recommendations.
- C. Adjust for proper operation within manufacturer's published tolerances.

3.6 CLEANING

- A. Touch up scratched surfaces using materials recommended by manufacturer. Match touchup paint color with barrier finish.
- B. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

3.7 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.
- B. See Section 017900 - Demonstration and Training, for additional requirements.
- C. Demonstration: Demonstrate operation of the barrier to Owner's personnel.
 - 1. Use operation and maintenance data as reference during demonstration.
 - 2. Briefly describe function, operation, and maintenance of each component.
- D. Training: Train Owner's personnel on operation and maintenance of the barrier.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.

3.8 PROTECTION

- A. Protect installed units from subsequent construction operations.

3.9 MAINTENANCE

- A. See Section 017000 - Execution Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.

END OF SECTION