

IMPROVEMENTS TO VILLAS 1 & ADMINISTRATIVE OFFICE BUILDING

BALNEARIO PUBLICO DE BOQUERON

CABO ROJO, PUERTO RICO, 00623



TECHNICAL SPECIFICATIONS MANUAL

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VOLUME 1



TABLE OF CONTENTS

SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

Section 01100	Summary
Section 01200	Price and Payment Procedures
Section 01217	Tenant Allowances
Section 01300	Administrative Requirements
Section 01330	Submittal Procedures
Section 01400	Quality Requirements
Section 01500	Temporary Facilities and Controls
Section 01600	Product Requirements
Section 01700	Execution Requirements
Section 01730	Cutting and Patching

DIVISION 2 - SITE CONSTRUCTION

Section 02220	Demolition
Section 02754	Cement Concrete Paving
Section 02800	Site Improvements and Amenities
Section 02820	Chain Link Fences and Gates

DIVISION 3 - CONCRETE

Section 03300	Cast-In-Place Concrete
Section 03360	Concrete Finishes
Section 03530	Concrete Topping

DIVISION 4 - MASONRY

N/A

DIVISION 5 - METALS

N/A

DIVISION 6 - WOOD AND PLASTICS

Section 06400	Architectural Woodwork
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DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07310	Shingles
Section 07530	Elastomeric Membrane Roofing
Section 07900	Joint Sealers

DIVISION 8 - DOORS AND WINDOWS

Section 08120	Aluminum Door and Sidelight Frames
Section 08163	Aluminum Sliding Glass Doors
Section 08520	Aluminum Windows
Section 08550	Wood Windows
Section 08710	Door Hardware

DIVISION 9 - FINISHES

Section 09210	Gypsum Plaster
Section 09220	Portland Cement Plaster
Section 09253	Gypsum Sheathing
Section 09260	Gypsum Board Assemblies
Section 09263	Gypsum Board Shaft Wall Assemblies
Section 09300	Tile
Section 09511	Acoustical Panel Ceilings
Section 09512	Acoustical Tile Ceilings
Section 09910	Painting
Section 09931	Exterior Stains

DIVISION 10 - SPECIALTIES

Section 10210	Louvers and Vents
Section 10440	Interior Signage
Section 10523	Fire Extinguishers and Cabinets
Section 10810	Toilet Accessories

DIVISION 11 - EQUIPMENT

Section 11460	Unit Kitchens
Section 11690	Specialty Equipment

DIVISION 12 - FURNISHINGS

N/A

DIVISION 13 - SPECIAL CONSTRUCTION

Section 13850	Detection and Alarm
Section 13900	Fire Protection
Section 13930	Fire Suppression

DIVISION 14 - CONVEYING SYSTEMS

N/A

DIVISION 15 - MECHANICAL

Section 15050	Basic Mechanical Materials
Section 15400	Plumbing
Section 15410	Plumbing Fixtures
Section 15440	Plumbing Pumps
Section 15460	Plumbing Equipment
Section 15900	Heating, Ventilating, and Air Conditioning

DIVISION 16 - ELECTRICAL

Section 16000	Electrical
Section 16050	Basic Electrical Materials And Methods
Section 16120	Conductors and Cables
Section 16130	Raceways and Boxes
Section 16140	Wiring Devices

Section 16230	Generator Assemblies
Section 16510	Interior Luminaires
Section 16521	Exterior Luminaires

END OF TABLE OF CONTENTS

SECTION 01100

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Project Identification: Improvements to Villas 1 & Administrative Office Building
- B. Project Summary: The project consists in improvements to the existing vacational complex site with Villas and Administrative Office Building located at the Balneario in Boqueron in the Municipality of Cabo Rojo in Puerto Rico.
- C. Particular Project Requirements: N/A
- D. Permits and Fees: Apply for, obtain, and pay for permits, fees, and utility company backcharges required to perform the work. Submit copies to Architect.
- E. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.
- F. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
- G. Existing Conditions: Notify Architect of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.
- H. Coordination:
 - 1. Coordinate the work of all trades.
 - 2. Prepare coordination drawings for areas above ceilings where close tolerances are required between building elements and mechanical and electrical work.
 - 3. Verify location of utilities and existing conditions.
- I. Installation Requirements, General:
 - 1. Inspect substrates and report unsatisfactory conditions in writing.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.
 - 3. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
 - 4. Install materials in exact accordance with manufacturer's instructions and approved submittals.
 - 5. Install materials in proper relation with adjacent construction and with proper appearance.
 - 6. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the Owner.
 - 7. Refer to additional installation requirements and tolerances specified under individual specification sections.
- J. Limit use of work as indicated. Keep driveways and entrances clear.
- K. Maintain existing building in a weathertight condition. Repair damage caused by construction operations. Protect building and its occupants.
- L. Definitions:

1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
 2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
 3. Match Existing: Match existing as acceptable to the Owner.
- M. Intent: Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.
- N. Writing style: Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, 'Provide tile' means 'Contractor shall provide tile.'

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 ALLOWANCES

- A. Lump sum allowances and unit cost allowances are listed below. Amounts shall include all costs including overhead and profit except as specifically noted.
- B. Coordinate allowances with requirements for related and adjacent work.
- C. Notify Owner of date when final decision on allowance items is required to avoid delays in the work.
- D. Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing, waste, and similar margins.
- E. Submit invoices or delivery slips to indicate actual quantities of materials delivered and costs. Indicate amounts of applicable trade discounts.
- F. Lump Sum Allowances: Include the following amounts in the base bid for materials, installation, overhead, profit and all costs for the following items.
 - 1. Landscaping:
 - 2. Door [Finish] Hardware:
 - 3. Signage:
 - 4. Window Treatment:
 - 5. Kitchen Appliances:
 - 6. Kitchen Casework:
 - 7. Elevator Cab:
 - 8. Plumbing Fixtures:
 - 9. HVAC Modifications:
 - 10. Lighting Fixtures:
- G. Unit cost allowances: The following items will be selected at a later date and unit costs below are for materials only. Installation and all other costs are to be included in the base bid. Refer to the Drawings to determine quantities required, multiply by unit cost below, and include total within base bid.
 - 1. Brick (\$/1000):
 - 2. Carpet (\$/sq. yd.):
 - 3. Wall Covering (\$/sq. yd.):
 - 4. Electrical Outlets (data, telephone, electrical):

1.2 ALTERNATES

- A. Provide total price for each alternate in Bid Form. Include cost of modifications to other work to accommodate alternate. Include related costs such as overhead and profit.
- B. Owner will determine which alternates are selected for inclusion in the Contract.
- C. Coordination: Modify or adjust affected adjacent work as necessary to integrate work of the alternate into Project.

- D. Alternates are described briefly in this section. The Contract Documents define the requirements for alternates.
- E. Coordinate alternates with related work to ensure that work affected by each selected alternate is properly accomplished.
- F. List of alternates:
 - A. Mar sin Barreras - Demolition of existing structure

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION – NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01217
TENANT ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Tenant areas for fit-out have not been designed; however the Owner requires costs for tenant improvements be included in the base bid. Based on the rentable square footage of the building, provide the following items in the base bid.
- B. The Owner will determine the rentable square footage of the building and number of tenants to be included under tenant allowances and notify the Bidder by addenda.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials, products and installation shall comply with project specifications for type of work involved.

PART 3 - EXECUTION

3.1 SCHEDULE (THE FOLLOWING ARE EXAMPLES ONLY)

- A. Tenant Entrance Door: 1-3/4" natural finish wood door, UL C label, with painted metal frame, hinges, mortise lockset, closer and stop; 1 per tenant.
- B. Tenant Interior Door: 1-3/4" painted wood door with metal frame, hinges, latchset and stop; 1 per 20 lineal foot of partition.
- C. Demising Partitions: 1-hour rated 5/8" gypsum drywall on 2-1/2" studs, STC rated construction, painted, with vinyl base; 1 lineal foot per 20 square feet. Terminate at deck above.
- D. Tenant Interior Partition: 5/8" gypsum drywall on 2-1/2" metal studs, painted, with vinyl base; 1 lineal foot per 20 square feet. Brace and terminate at 6" above ceiling.
- E. Ceilings: 2' x 4' x 3/4" mineral fiber acoustical panel with medium natural fissure and with exposed T-grid and perimeter moldings.
- F. Flooring: Carpet, \$20.00 per square yard; 100% of area.
- G. Window Treatment: 1" metal-slat horizontal blinds at all exterior windows.
- H. HVAC: VAV terminals with thermostat and associated insulated ductwork: 1 per 1500 square feet.
- I. Light Fixtures: One 2' by 4' 3-tube fluorescent ceiling fixture per 80 square feet; 1 wall switch per 5 fixtures.
- J. Electrical Outlets: One duplex unit with coverplate per 100 square feet.

- K. Telephone and Data Outlets: One empty wall box with conduit to above ceiling per 100 square feet.
- L. Sprinklers: One per 150 square feet.
- M. Exit Signs: 1 per 3000 square feet.

END OF SECTION

SECTION 01300
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide administrative requirements for the proper coordination and completion of work including the following:
 - 1. Supervisory personnel.
 - 2. Preconstruction conference.
 - 3. Project meetings, minimum of two per month; distribute minutes.
- B. Submit daily and special reports.
- C. Submit progress schedule, bar-chart type, updated monthly.
- D. Prepare submittal schedule; coordinate with progress schedule.
- E. Submit schedule of values.
- F. Submit schedule of required tests including payment and responsibility.
- G. Perform surveys:
 - 1. Laying out the work and verifying locations during construction.
 - 2. Final site survey.
- H. Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.
- I. Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.
- J. Submit payment request procedures.
- K. Clean and protect the work.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01330
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide types of submittals listed in individual sections and number of copies required below.
 - 1. Shop drawings, reviewed and annotated by the Contractor - transparency and two blackline prints.
 - 2. Product data - 4 copies.
 - 3. Samples - 2, plus extra samples as required to indicate range of color, finish, and texture to be expected.
 - 4. Inspection and test reports - 4 copies.
 - 5. Warranties - 4 copies.
 - 6. Survey data - 4 copies.
 - 7. Closeout submittals - 4 copies.
 - 8. Project photographs - 8 - 8x10 color prints each month and at beginning and end of construction. Include negatives. Date and time stamp each photograph as it is being taken so stamp is integral to photograph.
- B. Comply with project format for submittals.
- C. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.
- D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.
- E. Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Contractor, supplier or installer responsible for performance of warranty shall sign warranties.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 QUALITY CONTROL

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

1.2 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate. Comply with manufacturers' tolerances.

1.3 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

1.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to perform the following as applicable, and to initiate instructions when necessary.
 - 1. Observe site conditions.
 - 2. Conditions of surfaces and installation.
 - 3. Quality of workmanship.
 - 4. Start-up of equipment.
 - 5. Test, adjust and balance of equipment.

1.5 CONTRACTOR'S QUALITY CONTROL

- A. Perform quality control during installation.

1.6 MOCK-UP REQUIREMENTS

- A. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes. Accepted mock-ups shall be a comparison standard for the remaining Work.
- B. Where mock-up has been accepted by Architect and no longer needed, remove mock-up and clear area when directed to do so.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide temporary services and utilities, including utility costs:
 - 1. Water (potable and non-potable).
 - 2. Lighting and power.
 - 3. Metering.
 - 4. Telephone.
 - 5. Toilet facilities.
 - 6. Materials storage.
- B. Provide construction facilities, including utility costs:
 - 1. Construction equipment.
 - 2. Dewatering and pumping.
 - 3. Enclosures.
 - 4. Heating.
 - 5. Lighting.
 - 6. Elevator.
 - 7. Access.
 - 8. Roads.
- C. Provide security and protection requirements:
 - 1. Fire extinguishers.
 - 2. Site enclosure fence, barricades, warning signs, and lights.
 - 3. Building enclosure and lock-up.
 - 4. Environmental protection.
 - 5. Pest control during and at the end of construction.
 - 6. Snow and ice removal if applicable.
- D. Provide personnel support facilities:
 - 1. Architect's field office with telephone, fax and data connection.
 - 2. Contractor's field office.
 - 3. Sanitary facilities.
 - 4. Drinking water.
 - 5. Project identification sign.
 - 6. Cleaning, trash removal and legal disposal of materials.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01600
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as acceptable to manufacturers of primary materials.
- B. Provide products selected or equal approved by Architect. Products submitted for substitution shall be submitted with complete documentation, and include construction costs of substitution including related work.
- C. Request for substitution must be in writing. Conditions for substitution include:
 - 1. An 'or equal' phrase in the specifications.
 - 2. Specified material cannot be coordinated with other work.
 - 3. Specified material is not acceptable to authorities having jurisdiction.
 - 4. Substantial advantage is offered to the Owner in terms of cost, time, or other valuable consideration.
- D. Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Approval of shop drawings, product data, or samples containing substitutions is not an approval of a substitution unless an item is clearly presented as a substitution at the time of submittal.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01700
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The following are prerequisites to substantial completion. Provide the following:
 - 1. Punch list prepared by Contractor and subcontractors as applicable.
 - 2. Supporting documentation.
 - 3. Warranties.
 - 4. Certifications.
 - 5. Occupancy permit.
 - 6. Start-up and testing of building systems.
 - 7. Change over of locks.
 - 8. Meter readings.
- B. Provide the following prerequisites to final acceptance:
 - 1. Final payment request with supporting affidavits.
 - 2. Completed punch list.
- C. Provide a marked-up set of drawings including changes, which occurred during construction.
- D. Provide the following during project closeout:
 - 1. Submission of record documents.
 - 2. Submission of maintenance manuals.
 - 3. Training and turnover to Owner's personnel.
 - 4. Final cleaning and touch-up.
 - 5. Removal of temporary facilities.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01730
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cutting and patching work to properly complete the work of the project, complying with project requirements for:
 - 1. Structural work.
 - 2. Mechanical/electrical systems.
 - 3. Visual requirements, including detailing and tolerances.
 - 4. Operational and safety limitations.
 - 5. Fire resistance ratings.
 - 6. Inspection, preparation, and performance.
 - 7. Cleaning.
- B. Do not cut and patch in a manner that would result in a failure of the work to perform as intended, decrease energy performance, increase maintenance, decrease operational life, or decrease safety performance.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Match existing materials for cutting and patching work with new materials conforming to project requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Inspect conditions prior to work to identify scope and type of work required. Protect adjacent work. Notify Owner of work requiring interruption to building services or Owner's operations.
- B. Perform work with workmen skilled in the trades involved. Prepare sample area of each type of work for approval.
- C. Cutting: Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Inspect for concealed utilities and structure before cutting.
- D. Patching: Make patches, seams, and joints durable and inconspicuous. Comply with tolerances for new work.
- E. Clean work area and areas affected by cutting and patching operations.

END OF SECTION

SECTION 02220

DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Building and Site Demolition:

1. Demolition of designated building structures.
2. Demolition of site improvements including paving, curbing, site walls, and utility structures.
3. Demolition of below-grade foundations and site improvements to depth to avoid conflict with new construction or site work.
4. Removal of hollow items or items which could collapse.
5. Detach items from existing construction and deliver them to Owner ready for reuse
6. Protection of site work and adjacent structures.
7. Disconnection, capping, and removal of utilities.
8. Pollution control during building demolition, including noise control.
9. Removal and legal disposal of materials.

B. Selective Demolition:

1. Selective demolition of interior partitions, systems, and building components designated to be removed.
2. Selective demolition of exterior facade, structures, and components designated to be removed.
3. Protection of portions of building adjacent to or affected by selective demolition.
4. Removal of abandoned utilities and wiring systems.
5. Notification to Owner of schedule of shut-off of utilities which serve occupied spaces.
6. Pollution control during selective demolition, including noise control.
7. Removal and legal disposal of materials.

C. Work of Prior Separate Contract:

1. Removal of asbestos or materials containing asbestos.
2. Removal of hazardous materials.
3. Removal of underground fuel tanks.

D. Asbestos and hazardous materials demolition or removal work is not part of this contract.

1.2 SUBMITTALS

- ###### A. Schedule:
- Submit for approval selective demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.

1.3 QUALITY ASSURANCE

- ###### A. Comply with governing codes and regulations. Use experienced workers.
- ###### B. Remove and store refrigerant according to regulations of authorities having jurisdiction.

1.4 PROJECT CONDITIONS

- ###### A. Immediate areas of work will not be occupied during selective demolition. The public, including children, may occupy adjacent areas.

- B. No responsibility for buildings and structures to be demolished will be assumed by the Owner

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Do not damage building elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to Owner, shall be removed from structure. Storage or sale of items at project site is prohibited.
- B. Locate, identify, disconnect, and seal or cap off utilities in buildings to be demolished.
- C. Provide and maintain interior and exterior shoring and bracing.
- D. No explosives are permitted.
- E. Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without the written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.
- F. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.
- G. Provide adequate protection against accidental trespassing. Secure project after work hours.
- H. Restore finishes of patched areas.

3.2 SCHEDULE

- A. Items for Protection During Demolition and Construction: (The following are samples only)
 - 1. [Designated site improvements, trees, and plantings.]
 - 2. [Adjacent construction.]
- B. Items to be Salvaged for Reinstallation:
 - 1. [Handrails.]
 - 2. [Wood trim.]
 - 3. [Light fixtures.]
- C. Items to be Salvaged for Delivery to Owner:
 - 1. [Doors and hardware.]
 - 2. [Toilet accessories.]
 - 3. [Light fixtures.]
 - 4. [Plumbing fixtures.]
 - 5. [Radiators]
 - 6. [Decorative elements.]
- D. Utilities Requiring Interruption, Capping, or Removal:
 - 1. [Electric.]
 - 2. [Heat.]
 - 3. [Water.]

4. [Gas.]
5. [Sewerage.]
6. [Steam.]
7. [Cable television.]

END OF SECTION

SECTION 02754
CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cast-in-place concrete paving over prepared subbase.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Design Mixes: Submit for approval design mixes, including adjustments for variations in project conditions.
- C. Test Reports: Submit for approval test reports.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Construction Tolerance: 1/8" in 10' for grade and alignment of top of forms; 1/4" in 10' for vertical face on longitudinal axis.
- C. Testing: Independent testing laboratory.
- D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete: ASTM C 150, Type I, Portland cement; ASTM C 33, normal weight aggregates; potable water.
 - 1. Design Mix: ASTM C 94, 3000 psi, 28 day minimum compressive strength.
 - 2. Slump Limits: 8 inches minimum with superplasticizer, 3 inches otherwise.
 - 3. Air Content: 5 to 8 percent.
 - 4. Finish: Broom finish, perpendicular to direction of travel.
 - 5. Finish: Exposed aggregate.
- B. Wire Mesh Reinforcement: Welded plain steel wire fabric, ASTM A 185.
- C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
- D. Fabricated Bar Mats: Steel bar or rod mats, ASTM A 184, using ASTM A 615, Grade 60 steel bars.
- E. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60.

- F. Hook Bolts: ASTM A 307, Grade A threaded bolts.
- G. Liquid-Membrane Forming and Sealing Curing Compound: ASTM C 309, Type I, Class A.
- H. Bonding Compound: Polyvinyl acetate or acrylic base.
- I. Color Pigment: ASTM C 979.
- J. Marking Paint: FS TT-P-1952 white or yellow.
- K. Epoxy Adhesive: ASTM C 881.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ACI 301 for measuring, mixing, transporting, and placing concrete.
- B. Proof roll subbase and check for unstable areas. Report unsatisfactory conditions in writing. Beginning paving work means acceptance of subbase.
- C. Comply with concrete section for concrete mix, testing placement, joints, tolerances, curing, repairs and protection.
- D. Dispose of over-mixed concrete off-site in a legal manner.
- E. Protect concrete paving until weight of a person will not leave any impression. Remove and replace concrete paving, which shows impressions or other defects. Skim coating defects is not acceptable.
- F. Sweep and clean surface to eliminate loose material and dust and apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils

END OF SECTION

SECTION 02800
SITE IMPROVEMENTS AND AMENITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide site improvements and furnishings.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide units specifically designed for exterior exposure and intended use:
 - 1. Fencing:
 - a. Flat bar steel picket type.
 - b. Wood stockade type.
 - 2. Benches:
 - a. Concrete type.
 - b. Concrete and wood type.
 - c. Cast-iron type.
 - d. Cast-iron and wood type.
 - 3. Trash Receptacles:
 - a. Metal type.
 - b. Precast concrete type.
 - c. Wood type.
 - 4. Bicycle Racks: Galvanized steel.
 - 5. Picnic Tables: Wood with attached seating.
 - 6. Bollards:
 - a. Steel bollards.
 - b. Concrete bollards.
 - c. Concrete filled steel bollards.
 - d. Granite bollards.
 - 7. Stone Edging: Granite edging.
 - 8. Site Lighting: Pole mounted fixtures.
 - 9. Drinking Fountains: Precast concrete.
 - 10. Playground Equipment: Swings and climbing structures, wood with laminated timbers, spring-mounted animals.

11. Play Area Surfacing: Fibrous material; sand not acceptable.
12. Athletic Paving, and Surfacing: Composition surfacing and prepared base.
13. Sports Fixtures: Basketball standards and baseball backstop.
14. Site Walls:
 - a. Local stone, loose-laid type.
 - b. Timber type.
 - c. Masonry type.
15. Timber Retaining Walls: Pressure treated southern yellow pine.
16. Timber Bridges: Pre-engineered and preservative treated wood.
17. Steel Beam Guardrails: Galvanized steel and anchorage, DOT requirements.
18. Walkway, Roadway, and Parking Appurtenances: Custom design.
19. Clotheslines: Clothes drying arms and clotheslines.
20. Site Signage: Directional or informational signage; multilingual as applicable to area.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper function. Clean and protect work from damage.

END OF SECTION

SECTION 02820

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide chain link fencing and gates for site perimeter and areas requiring separation.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Steel Chain-Link Fence Fabric:
 - 1. Mesh and Wire Size: 2 inch mesh, 0.192 inch diameter (6 gauge).
 - 2. Mesh and Wire Size: 2 inch mesh, 0.148 inch diameter (9 gauge).
 - 3. Mesh and Wire Size: 2 inch mesh, 0.120 inch diameter (11 gauge).
 - 4. Mesh and Wire Size: 1-3/4 inch mesh, 0.120 inch diameter (11 gauge).
 - 5. Mesh and Wire Size: 2-1/8 inch mesh, 0.113 inch diameter (11-1/2 gauge).
 - 6. Mesh and Wire Size: 3/8 inch mesh, 0.120 inch diameter (11 gauge).
 - 7. Coating: ASTM A 817, Type 1, aluminized.
 - 8. Coating: ASTM A 817, Type 2, Class 1, zinc-coated (galvanized) applied after weaving.
 - 9. Coating: ASTM A 817, Type 2, Class 2, zinc-coated (galvanized).
 - 10. Coating: ASTM A 817, Type 3, Class 1, zinc-aluminum-mischmetal.
 - 11. Coating: ASTM A 817, Type 3, Class 2, zinc-aluminum-mischmetal.
 - 12. Coating: ASTM F 668, Class 1, PVC.
 - 13. Coating: ASTM F 668, Class 2a, PVC.
 - 14. Coating: ASTM F 668, Class 2b, PVC.
- B. Aluminum Alloy Fabric:
 - 1. Mesh and Wire Size: 2 inch mesh, 0.192 inch diameter (6 gauge).
 - 2. Mesh and Wire Size: 2 inch mesh, 0.148 inch diameter (9 gauge).
 - 3. Mesh and Wire Size: 1-3/4 inch mesh, 0.148 inch diameter (9 gauge).
 - 4. Mesh and Wire Size: 1 inch mesh, 0.148 inch diameter (9 gauge).
- C. Framework:
 - 1. Galvanized steel, ASTM F 1083.
 - 2. Polymer-coated steel.
 - 3. Aluminum, ASTM B 429, Schedule 40, alloy 6063-T6, mill finish.

D. Gates:

1. Swinging type.
2. Overhead mounted sliding type.
3. Cantilevered sliding type.

E. Framing and Fittings:

1. End, corner, and pull posts.
2. Line and intermediate posts.
3. Gate posts.
4. Top rail.
5. Tension wire.
6. Tie wires.
7. Top rail.
8. Intermediate rail.
9. Bottom rail.
10. Post and line caps.
11. Barbed wire supporting arms.
12. Barbed wire.
13. Barbed tape.
14. Privacy slats.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions and approved submittals. Comply with ASTM F 567. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Install posts to depth to avoid frost heave.
- B. Cut pipe with pipe-cutters only. Cutting with backsaws is not acceptable. Tack weld gates for strength. Use spring loaded latches, not yokes.
- C. Restore or replace damaged components. Clean and protect work from damage.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cast-in-place concrete for general building construction, including, without limitation:
 - 1. Footings, foundations, and basement walls.
 - 2. Slabs on grade.
 - 3. Concrete fill for metal floor and roof decks.
 - 4. Base course for exterior pavers.
- B. Requirements (materials, mixes, finishes) apply to concrete work specified in other sections, such as sidewalk paving and fill for metal pan stair treads.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.
- C. Mix Design: Submit for approval mix design proposed for use.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Testing: Employ an independent testing agency acceptable to Owner to design concrete mixes and to perform material evaluation tests. Provide 7 and 28 day cylinder tests. Comply with ASTM C 143, C 173, C 31 and C 39.
- C. Standards:
 - 1. ACI 301, Specifications for structural Concrete for Buildings.
 - 2. ACI 318, Building Code Requirements for Reinforced Concrete, and CRSI Manual of Standard Practice.
- D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
- E. Floor Flatness and Levelness Tolerances:
 - 1. Subfloors Under Materials Such as Concrete Toppings, Ceramic Tile, and Sand Bed Terrazzo: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 15, floor levelness (Fl) of 13.
 - 2. Subfloors Under Materials Such As Vinyl Tile, Epoxy Toppings, Paint, and Carpet: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 20, floor levelness (Fl) of 17.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete Design Mixes, ASTM C 94, 28 Day Compressive Strength:
 - 1. Columns, Beams, Walls, Foundations, and Footings:
 - a. Compressive Strength: 4000 psi.
 - b. Compressive Strength: 3500 psi.
 - c. Compressive Strength: 3000 psi.
 - d. Compressive Strength: 2500 psi.
 - 2. Slabs on Grade and Paving Base:
 - a. Compressive Strength: 4000 psi.
 - b. Compressive Strength: 3500 psi.
 - c. Compressive Strength: 3000 psi.
 - d. Compressive Strength: 2500 psi.
 - 3. Concrete on Metal Deck:
 - a. Compressive Strength: 4000 psi.
 - b. Compressive Strength: 3500 psi.
 - c. Compressive Strength: 3000 psi.
 - d. Compressive Strength: 2500 psi.
 - 4. Exterior Site Concrete and Pads Exposed to Weather:
 - a. Compressive Strength: 4000 psi.
 - b. Compressive Strength: 3500 psi.
 - c. Compressive Strength: 3000 psi.
 - d. Compressive Strength: 2500 psi.
- B. Formwork: Plywood or metal panel formwork sufficient for structural and visual requirements.
 - 1. Special forms for textured finish concrete.
 - 2. Metal, plastic or paper tubes for cylindrical columns and supports.
- C. Reinforcing Materials:
 - 1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
 - 2. Reinforcing Bars: ASTM A 767, Class II, galvanized.
 - 3. Reinforcing Bars: ASTM A 775, epoxy-coated.
 - 4. Steel Wire: ASTM A 82.
 - 5. Steel Wire Fabric: ASTM A 185, welded.
 - 6. Steel Wire Fabric: ASTM A 497, welded, deformed.
 - 7. Fiber Reinforcement: Engineered polypropylene fibers for secondary reinforcement of slabs.
- D. Concrete Materials: ASTM C 150, Type I, Portland cement; potable water.
 - 1. Normal weight aggregates, ASTM C 33.
 - 2. Lightweight aggregates, ASTM C 330.
 - 3. Fly Ash: ASTM C 618, Type F.
 - 4. Fiber Reinforcement: Polypropylene fibers for secondary reinforcement, ASTM C 1116, Type III.
- E. Concrete Admixtures: Containing less than 0.1 percent chloride ions.
 - 1. Air-Entraining Admixture: ASTM C 260, for exterior exposed concrete and foundations exposed to freeze-thaw.
 - 2. Water-Reducing Admixture: ASTM C 494, Type A, for placement and workability.
 - 3. High-Range Water-Reducing Admixture, Super Plasticizer: ASTM C 494, Type F or G for placement and workability.
 - 4. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E for placement and workability.

5. Water-Reducing, Retarding Admixture: ASTM C 494, Type D for placement and workability.
- F. Auxiliary Materials:
1. Reglets: Galvanized sheet steel reglets, minimum 26 gauge (.018 inch).
 2. Waterstops: Rubber, PVC or self expanding butyl/bentonite waterstops.
 3. Vapor Retarder: ASTM D 4397 polyethylene sheet, 10 mils.
 4. Vapor Retarder: Reinforced plastic ASTM E 1745, Class A.
 5. Vapor Barrier: Premolded membrane, ASTM E 96, Method B, 0 vapor transmission rate.
 6. Nonslip Aggregate Finish: Fused aluminum oxide granules or crushed emery.
 7. Liquid Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class A.
 8. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type 1, Class B.
 9. Evaporation Control Compound: Monomolecular film-forming compound.
 10. Underlayment Compound: Free-flowing, self-leveling cement-based compound.
 11. Bonding Compound: Polyvinyl acetate or acrylic base.
 12. Epoxy Adhesive: ASTM C 881, two-component material.
- G. Concrete Finishes For Formed Surfaces:
1. Surfaces Not Exposed To View: As-cast form finish.
 2. Surfaces Exposed To View: Smooth form finish.
 3. Surfaces Exposed To View: Smooth rubbed finish.
 4. Surfaces Exposed To View: Grout-cleaned finish.
 5. Surfaces Exposed To View: Special textured form finish.
- H. Concrete Finishes for Monolithic Slabs:
1. Scratch finish for surfaces to receive concrete floor topping or mortar setting bed.
 2. Trowel finish for surfaces to be exposed to view or covered with resilient flooring, carpet, tile, or other thin finish system.
 3. Trowel and fine broom finish for surfaces to receive thin-set ceramic or quarry tile.
 4. Nonslip broom finish for exterior concrete platforms, steps, ramps,, and sloped walls.
 5. Nonslip aggregate finish for concrete stair treads, platforms, ramps, and sloped walks.
 6. Exposed aggregate finish, chemical retarder type.
 7. Patterned finish, pressed into concrete.
 8. Colored wear-resistant finish, dry shake type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 94. Do not change mix design without approval. Calcium chloride admixtures are not permitted.
- B. Chamfer exposed edges/corners to provide straight lines.
- C. Tolerance: Plus 1/8" in 10' for grade, alignment, and straightness.
- D. Construction Joints: Use keyways, continue reinforcement through joint.
- E. Expansion Joints: For exterior work locate 30' o.c. at approved locations. Provide smooth dowels across joint which permit 1" horizontal movement and no vertical shear movement.
- F. Isolation Joints: Provide between slabs and vertical elements such as columns and structural walls.

- G. Control Joints: Provide sawn or tooled joints or removeable insert strips; depth equal to 1/4 slab thickness. Spacing as required and approved.
- H. Wall Finishes: As-cast and patched for concealed work; rubbed smooth, filled and cement paste coated for exposed work.
- I. Slab Finishes: Obtain sample approval before beginning work.
 - 1. Scratch: For surfaces to receive mortar setting beds or cementitious flooring materials.
 - 2. Trowel: Hard, smooth, uniform surface for areas to receive resilient flooring, carpet, or other thin finish material.
 - 3. Broom: After trowel finishing, roughen surface by fine brooming perpendicular to traffic direction for exposed exterior walks, steps and ramps.
 - 4. Non-Slip Aggregate: After trowel finishing, uniformly trowel 25-lbs./100 s. f. of damp non-slip aggregate into surface. Cure, then rub lightly to expose aggregate. Use for interior exposed concrete stairs and ramps.
 - 5. Exposed Aggregate: Use chemical retarder or tamp aggregate into wet concrete and expose by brushing with water. Use where indicated.
 - 6. Hardener Finish: For exposed interior concrete floors. Follow manufacturer's directions.
- J. Cure and protect work. Report defective work in writing.

END OF SECTION

SECTION 03360
CONCRETE FINISHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide exposed concrete finishes mechanically applied to cast-in-place concrete surfaces.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Abrasive Blast Finish:
 - 1. Brush Cut: Face of fine aggregate exposed, no reveal.
 - 2. Light Cut: Fine aggregate exposed, maximum 1/16 inch reveal.
 - 3. Medium Cut: Coarse aggregate exposed, 1/4 inch reveal.
 - 4. Heavy Cut: Coarse aggregate exposed to maximum projection of 1/3 diameter; 3/8 inch to 1/2 inch reveal.
 - 5. Acid Cleaning: Weak acid wash after blasting and neutralization of acid.
- B. Bushhammer Finish:
 - 1. Finish: Depth of cut and aggregate exposure matching control samples.
 - 2. Acid Cleaning: Weak acid wash after blasting and neutralization of acid.
- C. Scrubbed Finish:
 - 1. Finish: Wire brush scrubbed finish producing uniform exposure of aggregate.
 - 2. Acid Cleaning: Weak acid wash after blasting and neutralization of acid.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform operations to achieve approved appearance. Protect adjacent work from damage. Coordinate with work of other sections.

- B. Restore damaged finishes as approved. Clean and protect work from damage.

END OF SECTION

SECTION 03530
CONCRETE TOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide monolithic concrete floor toppings over concrete base slabs.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Standard Aggregate Toppings:
 - 1. Portland cement: ASTM C 150, Type I or Type III.
 - 2. Standard aggregate: ASTM C 33.
 - 3. Design mix: ASTM C 94, 3500 psi, 28-day compressive strength.
 - 4. Design mix: ASTM C 94, 5000 psi, 28-day compressive strength.
 - 5. Reinforcement: Welded steel wire fabric, ASTM A 185.
- B. Heavy-Duty Metallic Floor Topping: Iron aggregate and cement topping, 10,000 psi, 28 day compressive strength; 1400 psi flexural strength.
- C. Finish:
 - 1. Trowel finish using power driven trowel.
 - 2. Ground finish using power driven grinders.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cure and protect in accordance with Section 03300. Install to tolerance of plus or minus 1/8" in 10'.
- B. Protect adjacent work from damage. Coordinate with work of other sections.
- C. Restore damaged finishes as approved. Clean and protect work from damage.

END OF SECTION

SECTION 06400
ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide exterior architectural woodwork:
 - 1. Standing and running trim and rails.
 - 2. Siding.
 - 3. Decks.
 - 4. Ornamental items.
 - 5. Door frames.
 - 6. Shutters.
 - 7. Remodeling of existing exterior architectural woodwork.
- B. Provide interior architectural woodwork:
 - 1. Standing and running trim and rails.
 - 2. Casework and countertops.
 - 3. Wood paneling and wainscots.
 - 4. Plastic-laminate cabinets and countertops.
 - 5. Solid-surfacing-material countertops
 - 6. Plywood paneling.
 - 7. Ornamental items.
 - 8. Stairwork and rails.
 - 9. Door frames and jambs.
 - 10. Shop finishing of woodwork.
 - 11. Shelving and closet specialties.
 - 12. Remodeling of existing interior architectural woodwork.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: Architectural Woodwork Institute (AWI) "Architectural Woodwork Quality Standards."

- C. Standards: Woodwork Institute of California (WIC) "Manual of Millwork."
- D. Preservative Treatment: Nonpressure method, exterior type, AWP A N1
- E. Fire-Retardant Treatment:
 - 1. Lumber: AWP A C20, non-corrosive type.
 - 2. Plywood: AWP A C27, non-corrosive type.
 - 3. Particleboard: ASTM E 84, flame spread 20 or less.
- F. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.
 - 3. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 - 4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
 - 5. Hardwood Plywood and Face Veneers: HPVA HP-1.
- G. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship of each type of architectural woodwork.

PART 2 - PRODUCTS

2.1 EXTERIOR MATERIALS

- A. Exterior Standing and Running Trim and Rails:
 - 1. Species for Transparent Finish: Teak.
 - 2. Species for Transparent Finish: All heart redwood
 - 3. Species for Transparent Finish: B and Better, 1 and 2 Clear Western Red Cedar.
 - 4. Species for Opaque Finish: Clear Heart Redwood.
 - 5. Species for Opaque Finish: White Pine Or Sugar Pine.
 - 6. Species for Opaque Finish: Any closed-grain hardwood.
 - 7. Grade: Premium.
 - 8. Grade: Custom.
 - 9. Grade: Economy.
 - 10. Finish: Semi-transparent stain.
 - 11. Finish: Opaque stain.
 - 12. Finish: Paint.
- B. Lumber Siding:
 - 1. Type: Kiln dried solid lumber bevel siding.
 - 2. Species and Grade: Clear all heart redwood.
 - 3. Species and Grade: B and Better southern pine.
 - 4. Species and Grade: Clear vertical grain heart western red cedar.
 - 5. Type: Bevel Siding
 - 6. Type: Drop Siding.
 - 7. Type: V-Edge, Tongue-and-Groove Siding.
 - 8. Texture: Rough.
 - 9. Texture: Smooth.
 - 10. Finish: Semi-transparent stain.
 - 11. Finish: Opaque stain.
 - 12. Finish: Paint.

C. Plywood Siding:

1. Type: APA 303 series siding.
2. APA-Rated siding, pressure-preservative treated.
3. APA-Rated siding, factory coated with exterior acrylic latex stain.
4. Face Grade: 303-OC (Clear)
5. Face Grade: 303-OL (Medium density overlay)
6. Face Grade: 303-NR (natural rustic)
7. Face Grade: 303-SR. (synthetic rustic)
8. Species/Facing: Cedar siding.
9. Species/Facing: Redwood siding.
10. Species/Facing: Fir siding.
11. Species/Facing: Pine siding.
12. Species/Facing: Medium Density Overlay siding.
13. Texture: Rough with selected pattern.
14. Texture: Smooth with selected pattern.
15. Pattern: Plain.
16. Pattern: Channel groove.
17. Pattern: Texture 1-11.
18. Pattern: Reverse board-and-batten; grooves.
19. Finish: Semi-transparent stain.
20. Finish: Opaque stain.
21. Finish: Paint.

D. Hardboard Siding: Primed hardboard, AHA A135.6, with exterior alkyd primer.

1. Type: lap siding.
2. Type: beaded-edge lap siding.
3. Type: shiplap-edge panels, with grooves, simulating wood drop siding.
4. Type: square-edge flat panels; without grooves.
5. Type: shiplap-edge panels, channel grooved.
6. Texture: Smooth
7. Texture Wood-grain textured
8. Texture Shingle textured
9. Texture Stucco textured.

E. Siding Auxiliary Materials:

1. Felt Underlayment: Asphalt saturated organic felt, unperforated, ASTM D 226, Type 1, No. 15.
2. Fasteners: Stainless steel, non-corrosive aluminum or hot-dip galvanized siding nails.
3. Horizontal Joint Flashing for Panel Siding: Preformed galvanized steel or aluminum.

F. Exterior Ornamental Items and Decks:

1. Species for Transparent Finish: Clear fir.
2. Species for Transparent Finish: Clear heart redwood, quarter sawn.
3. Species for Transparent Finish: Clear heart redwood.
4. Species for Opaque Finish: Clear heart redwood.
5. Species for Opaque Finish: White pine or sugar pine.
6. Species for Opaque Finish: Any closed-grain hardwood.
7. Grade: Premium.
8. Grade: Custom.
9. Grade: Economy.
10. Finish: Semi-transparent stain.

11. Finish: Opaque stain.
12. Finish: Paint.

G. Exterior Door Frames:

1. Species for Transparent Finish: Clear heart redwood, quarter sawn.
2. Species for Transparent Finish: Clear heart redwood.
3. Species for Opaque Finish: Clear heart redwood.
4. Species for Opaque Finish: White pine or sugar pine.
5. Species for Opaque Finish: Any closed-grain hardwood.
6. Grade: Premium.
7. Grade: Custom.
8. Finish: Semi-transparent stain.
9. Finish: Opaque stain.
10. Finish: Paint.

H. Shutters:

1. Species for Transparent Finish: Honduras mahogany.
2. Species for Transparent Finish: Clear heart redwood.
3. Species for Opaque Finish: Clear heart redwood.
4. Species for Opaque Finish: Ponderosa pine.
5. Species for Opaque Finish: Eastern white pine.
6. Grade: Premium.
7. Grade: Custom.
8. Grade: Economy.
9. Finish: Semi-transparent stain.
10. Finish: Opaque stain.
11. Finish: Paint.

I. Exterior Decks:

1. Species: Clear fir.
2. Species: Clear heart redwood.
3. Grade: Premium.
4. Grade: Custom.
5. Finish: Semi-transparent stain.
6. Finish: Opaque stain.
7. Finish: Paint.

J. Exterior Fasteners:

1. Nails: Stainless steel, aluminum or hot-dip galvanized siding nails.
2. Screws and Anchors: Noncorrosive, type required for secure anchorage.

2.2 INTERIOR MATERIALS

A. Interior Standing and Running Trim and Rails:

1. Species for Transparent Finish: Rift sawn red oak.
2. Species for Transparent Finish: Match existing.
3. Species for Opaque Finish: White pine or sugar pine.
4. Species for Opaque Finish: Any closed-grain hardwood.
5. Grade: Premium.
6. Grade: Custom.
7. Grade: Economy.

B. Interior Wood Casework:

1. Species for Transparent Finish: Rift sawn/cut red oak.
2. Species for Transparent Finish: Plain sawn/sliced natural birch.
3. Species for Transparent Finish: Quarter sawn/sliced African mahogany.
4. Species for Transparent Finish: Match existing.
5. Species for Opaque Finish: Closed grain hardwood.
6. Grade: Premium.
7. Grade: Custom.
8. Grade: Economy.
9. Face Style: Reveal overlay.
10. Face Style: Flush overlay.
11. Face Style: Flush.
12. Frame Fabrication: Face frame.
13. Frame Fabrication: Frameless.
14. Grain Matching: Vertical.
15. Veneer Matching of Leaves: Book.
16. Veneer Matching of Leaves: Slip.
17. Veneer Matching of Leaves: Random.
18. Veneer Matching of Leaves: End.
19. Veneer Matching In Panel Face: Running.
20. Veneer Matching In Panel Face: Slip.
21. Veneer Matching In Panel Face: Center.

C. Interior Plastic Laminate Clad Casework:

1. Laminate: High pressure decorative laminate, NEMA LD-3.
2. Grade: Premium.
3. Grade: Custom.
4. Grade: Economy.
5. Face Style: Reveal overlay.
6. Face Style: Flush overlay.
7. Face Style: Flush.
8. Frame Fabrication: Face frame.
9. Frame Fabrication: Frameless.

D. Casework Hardware and Auxiliary Materials:

1. Hardware Standard: ANSI/BHMA A156.9.
2. Hardware Finish and Base Metal: Satin stainless steel.
3. Hardware Finish and Base Metal: Satin chromium plated steel.
4. Hardware Finish and Base Metal: Satin chromium plated brass or bronze.
5. Hardware Finish and Base Metal: Dark oxidized satin bronze.
6. Glass: Clear float glass, ASTM C 1036.
7. Glass: Clear tempered glass, ASTM C 1048.

E. Interior Wood Countertops:

1. Type of Top: Solid wood board.
2. Type of Top: Solid laminated wood strips.
3. Type of Top: Wood veneer over core material.
4. Species for Transparent Finish: Rift sawn red oak.
5. Species for Transparent Finish: Plain sawn natural birch.
6. Species for Transparent Finish: Quarter sawn African mahogany.
7. Grade: Premium.

8. Grade: Custom.
 9. Grade: Economy.
 10. Veneer Matching of Leaves: Book.
 11. Veneer Matching of Leaves: Slip.
 12. Veneer Matching of Leaves: Random.
 13. Veneer Matching of Leaves: End.
 14. Veneer Matching In Panel Face: Running.
 15. Veneer Matching In Panel Face: Slip.
 16. Veneer Matching In Panel Face: Center.
- F. Interior Plastic Laminate Clad Countertops:
1. Laminate: High pressure decorative laminate, NEMA LD-3.
 2. Grade: Premium.
 3. Grade: Custom.
 4. Core: Plywood.
 5. Core: Particleboard.
 6. Core: As allowed by grade.
 7. Edge: Laminate.
 8. Edge: Lumber.
 9. Edge: Decorative.
- G. Solid Surfacing Material Countertops:
1. Type: Homogeneous solid sheets ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
 2. Grade: Premium.
 3. Grade: Custom.
 4. Grade: Economy.
 5. Edge: Decorative.
 6. Special Fabrication: Bowls.
 7. Special Fabrication: Decorative assemblies.
- H. Thermoset Decorative Overlay: Particleboard or medium-density fiberboard with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- I. Wood Paneling and Wainscots:
1. Species for Transparent Finish: Rift sawn red oak.
 2. Species for Transparent Finish: Plain sawn natural birch.
 3. Species for Transparent Finish: Quarter sawn African mahogany.
 4. Grade: Premium.
 5. Grade: Custom.
 6. Core: Veneer core plywood.
 7. Core: Particleboard.
 8. Core: Fire-retardant particleboard.
 9. Style: Flush type.
 10. Style: Applied panel type.
 11. Style: Stile-and rail type.
 12. Veneer Matching of Leaves: Book.
 13. Veneer Matching of Leaves: Slip.
 14. Veneer Matching of Leaves: Random.
 15. Veneer Matching of Leaves: End.
 16. Veneer Matching In Panel Face: Running.
 17. Veneer Matching In Panel Face: Slip.

18. Veneer Matching In Panel Face: Center.
19. Panel Matching Method: Premanufactured sets.
20. Panel Matching Method: Sequence-matched panel sets.
21. Panel Matching Method: Blueprint matched panels and components.

J. Plywood Paneling

1. Type: Hardwood veneer paneling, HPVA HP-1.
2. Species: Rotary cut natural birch veneer
3. Species: Plain sliced red oak veneer
4. Species: Plain sliced American walnut veneer.
5. Backing Veneer Species: Same species as face veneer
6. Backing Veneer Species: Any hardwood compatible with face species.
7. Construction: Veneer core.
8. Face Pattern: Plain pattern.
9. Face Pattern: V-grooved pattern.
10. Veneer Matching: Random.
11. Veneer Matching: Sequence matching.
12. Finish: Site finish.
13. Finish: Factory finish.

K. Interior Ornamental Items:

1. Species for Transparent Finish: Rift sawn/cut red oak.
2. Species for Transparent Finish: Plain sawn/sliced natural birch.
3. Species for Transparent Finish: Quarter sawn/sliced African mahogany.
4. Species for Transparent Finish: Match existing.
5. Species for Opaque Finish: Closed grain hardwood.
6. Grade: Premium.
7. Grade: Custom.
8. Grade: Economy.

L. Stairwork and Rails:

1. Species for Transparent Finish: Rift sawn/cut red oak.
2. Species for Transparent Finish: Match existing.
3. Species for Opaque Finish: Closed grain hardwood.
4. Grade: Premium.
5. Grade: Custom.
6. Grade: Economy.

M. Interior Frames and Jambs:

1. Species for Transparent Finish: Rift sawn/cut red oak.
2. Species for Transparent Finish: Plain sawn/sliced natural birch.
3. Species for Transparent Finish: Quarter sawn/sliced African mahogany.
4. Species for Transparent Finish: Match existing.
5. Species for Opaque Finish: Closed grain hardwood.
6. Grade: Premium.
7. Grade: Custom.
8. Grade: Economy.

N. Shelving and Closet Specialties:

1. Shelving: Plywood with hardwood edgeboard.
2. Shelving: PVC coated wire shelving system.
3. Closet Rods: Wood.

4. Closet Rods: Chrome plated steel.
 5. Closet Rods: PVC coated wire closet rod system.
- O. Auxiliary Materials:
1. Screws: FS FF-S-111.
 2. Nails: FS FF-N-105.
 3. Anchors: Type required for secure anchorage.
- P. Factory Finishing of Interior Architectural Woodwork [AWI Section 1500] [WIC Section 25]:
1. Transparent Finish:
 - a. Grade: Premium.
 - b. Grade: Custom.
 - c. Stain: Color as selected by Architect.
 - d. Sheen: Dull rubbed flat.
 - e. Sheen: Dull satin.
 - f. Sheen: Rubbed medium gloss.
 - g. Sheen: Bright rubbed semi-gloss.
 - h. Sheen: Full gloss.
 2. Opaque Finish:
 - a. Grade: Premium.
 - b. Grade: Custom.
 - c. Sheen: Dull rubbed flat.
 - d. Sheen: Dull satin.
 - e. Sheen: Rubbed medium gloss.
 - f. Sheen: Bright rubbed semi-gloss.
 - g. Sheen: Full gloss.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide work to sizes, shapes, and profiles indicated. Install work to comply with quality standards referenced. Back prime work and install plumb, level and straight with tight joints; scribe work to fit.
- B. [Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified for type of woodwork involved.]
- C. [Quality Standard: Install woodwork to comply with WIC Section 26 for the same grade specified for type of woodwork involved.]
- D. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Use non-corrosive fasteners for exterior work. Coordinate with work of other sections.
- E. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.
- F. Repair minor damage, clean and protect.

END OF SECTION

SECTION 07310
SHINGLES AND SHAKES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide shingles for roofing applications.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 20 years.
 - 2. Warranty Period: 25 years.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphalt Shingles:
 - 1. Manufacturers: Atlas Roofing Corporation, Celotex Roofing Products, CertainTeed Roofing Products, GAF Materials Corp., Georgia Pacific Corp., Owens-Corning Fiberglass, or approved equal.
 - 2. Type: Square tab, fiberglass strip shingles.
 - 3. Type: Square tab, organic-felt strip shingles.
 - 4. Type: Heavyweight, laminated, organic-felt strip shingles.
 - 5. Type: Three dimensional, fiberglass, laminated strip shingles.
 - 6. Type: Staggered-butt-edge, fiberglass strip shingles with tabs.
 - 7. Type: Staggered edge, fiberglass shingles.
 - 8. Accessories:
 - a. Hip and ridge shingles.
 - b. Underlayment felt, ASTM D 226.
 - c. Self-adhering sheet underlayment, granular or polyethylene Surfaced: ASTM D 1970 perimeter underlayment.
 - d. Metal flashing and drip edge.
 - e. Mechanically fastened snow guards.

B. Wood Roof Shingles:

1. Type: Western red cedar smooth-sawn CSSB's "Grading Rules for Certigrade Red Cedar Shingles."
2. Accessories:
 - a. Fire-Retardant Treatment: Exterior type, pressure-treated units.
 - b. Preservative Treatment: AWPAC34.
 - c. Felt, ASTM D 226 Type I.
 - d. Self-adhering sheet underlayment, granular or polyethylene Surfaced: ASTM D 1970 perimeter underlayment.
 - e. Metal flashing and drip edge.
 - f. Ridge vent.
 - g. Prefabricated hip and ridge shingles.
 - h. Mechanically fastened snow guards.

C. Wood Roof Shakes:

1. Type: Handsplit and resawn western red cedar meeting CSSB's "Grading Rules for Certi-Split Handsplit and Resawn Shakes."
2. Accessories:
 - a. Felt, ASTM D 226 Type I.
 - b. Self-adhering sheet underlayment, granular or polyethylene Surfaced: ASTM D 1970 perimeter underlayment.
 - c. Metal flashing and drip edge.
 - d. Ridge vent.
 - e. Prefabricated hip and ridge shingles.
 - f. Mechanically fastened snow guards.

D. Slate Shingles:

1. Manufacturers: American Slate Company, Evergreen Slate Co., Inc., Slate International, Inc., Vermont Structural Slate Company, Inc., or approved equal.
2. Type: Smooth, ASTM C 406, Grade S1.
3. Type: Rough, ASTM C 406, Grade S1.
4. Accessories:
 - a. Felt, ASTM D 226, Type I.
 - b. Self-adhering sheet underlayment, granular or polyethylene Surfaced: ASTM D 1970 perimeter underlayment.
 - c. Metal flashing and drip edge.
 - d. Mechanically fastened snow guards.

E. Metal Shingles:

1. Manufacturers: Alcoa Building Products, ATAS International, Inc., Berridge Manufacturing Co., Classic Products, Inc., Vail Metal Systems, Zappone Manufacturing, or approved equal.
2. Type: Formed aluminum sheet:
 - a. Finish: Mill.
 - b. Finish: High-performance fluoropolymer 2-coat.
3. Type: Aluminum-Zinc, Alloy-Coated Steel Sheet:
 - a. Finish: Granular Coated
4. Type: Zinc-Coated (Galvanized) Steel Sheet:
 - a. Finish: High-performance fluoropolymer 2-coat.
5. Accessories:
 - a. Glass-mat surface gypsum board underlayment water-resistant core.
 - b. Felt, ASTM D 226, Type I.
 - c. Self-adhering sheet underlayment, granular or polyethylene Surfaced: ASTM D 1970 perimeter underlayment.
 - d. Metal flashing and drip edge.

- e. Hip and ridge tiles.
- f. Mechanically fastened snow guards.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with recommendations of NRCA Steep Roofing Manual.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Install water protection sheet at valleys, ridges, and eaves.
- D. Restore damaged components. Clean and protect work from damage.

END OF SECTION

SECTION 07530

ELASTOMERIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide single-ply elastomeric roofing.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 10 years.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Listing: UL Class A external fire exposure:
- C. Listing: FM Class I construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. EPDM Membrane Roofing:
 - 1. Manufacturers: Carlisle SynTec Systems, Firestone Building Products Company, Johns Manville International, Inc., Versico or approved equal.
 - 2. Type: Loosely laid and ballasted.
 - 3. Type: Mechanically fastened.
 - 4. Type: Fully adhered.
 - 5. Membrane: ASTM D 4637, Type I, nonreinforced EPDM, 45 mils.
 - 6. Membrane: ASTM D 4637, II, scrim or fabric internally reinforced EPDM, 45 mils.
 - 7. Membrane: ASTM D 4637, Type I, nonreinforced EPDM, 60 mils.
 - 8. Membrane: ASTM D 4637, II, scrim or fabric internally reinforced EPDM, 60 mils.
- B. CSPE Membrane Roofing:
 - 1. Manufacturers: Burkeline Roofing Systems, Conklin Company Inc., Mule-Hide Products Co., Inc., Stevens Roofing Systems; Div. of JPS Elastomerics, or approved equal.
 - 2. Type: Loosely laid and ballasted.
 - 3. Type: Mechanically fastened.

4. Type: Fully adhered.
 5. Membrane: CSPE, 45 mils, ASTM D 5019, Type I, Grade 2.
- C. Auxiliary Materials:
1. Substrate Board Gypsum Board: ASTM C 36, Type X.
 2. Substrate Board: Glass-mat, water-resistant gypsum ASTM C 1177.
 3. Vapor Retarder: Bituminous vapor retarder.
 4. Insulation: Glass-fiber board.
 5. Insulation: Perlite board.
 6. Insulation: Polyisocyanurate board.
 7. Insulation: Extruded-polystyrene board insulation.
 8. Insulation: Molded-polystyrene board.
 9. Insulation: Cellulosic-fiber board.
 10. Insulation: Composite polyisocyanurate insulation board.
 11. Tapered Insulation: Fabricated to provide proper drainage.
 12. Recovery Board over Insulation: Plywood, mechanically fastened.
 13. Recovery Board over Insulation: Cementitious backer board, mechanically fastened.
 14. Ballast: Washed, rounded riverbed gravel.
 15. Ballast: Precast concrete pavers.
 16. Sheet Metal Accessories: SMACNA and NRCA recommendations.
 17. Walkway Protection Board: Compatible with membrane.
 18. Roof Pavers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Inspect substrate and report unsatisfactory conditions in writing. Beginning work means acceptance of substrate.
- B. Comply with roof system manufacturer's instructions and recommendations; clean, prime and prepare substrate.
- C. Install insulation with tightly butted joints and neatly fitted around penetrations.
- D. Begin roof installation only in presence of manufacturer's representative. Minimize seams and shingle overlaps to shed water.
- E. Where applicable, distribute ballast uniformly to 10 pounds per square foot or more as required by FM. Obtain approval of ballast weight before loading roof.
- F. Install walkway protection or pavers over an additional layer of membrane at locations indicated and where required to provide access to roof mounted equipment.
- G. Restore or replace damaged components. Protect work from damage.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide joint sealers at interior and exterior vertical and horizontal joints.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
 - 1. Include manufacturer's full range of color and finish options if additional selection is required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Field-Constructed Mock-Ups: Each joint type.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Urethane Elastomeric Joint Sealants:
 - 1. Manufacturers: Pecora Corp., Sika Corp., Sonneborn, Division of ChemRex Inc, Tremco, or approved equal.
 - 2. Type and Application: One-part nonsag urethane sealant, ASTM C 920:
 - a. Application: For joints in vertical surfaces.
 - b. Application: For joints in vertical and horizontal surfaces.
 - c. Application: For joints in horizontal surfaces.
 - d. Exterior use.
 - e. Exterior and interior use.
 - 3. Type and Application: Multi-part nonsag urethane sealant, ASTM C 920:
 - a. Application: For joints in vertical surfaces.
 - b. Application: For joints in vertical and horizontal surfaces.
 - c. Application: For joints in horizontal surfaces.
 - d. Exterior use.
 - e. Exterior and interior use.
- B. Silicone Elastomeric Joint Sealants:
 - 1. Manufacturers: Dow Corning, GE Silicones, Tremco, or approved equal.
 - 2. Type and Application: One-part nonacid-curing silicone sealant, ASTM C 920, modulus as required for application:

- a. Application: For joints in vertical surfaces.
 - b. Application: For joints in vertical and horizontal surfaces.
 - c. Application: For joints in horizontal surfaces.
 - d. Exterior use.
 - e. Exterior and interior use.
 - 3. Type and Application: Multi-part nonacid-curing silicone sealant, ASTM C 920, modulus as required for application:
 - a. Application: For joints in vertical surfaces.
 - b. Application: For joints in vertical and horizontal surfaces.
 - c. Application: For joints in horizontal surfaces.
 - d. Exterior use.
 - e. Exterior and interior use.
 - 4. Type and Application: One-part acid-curing silicone sealant, ASTM C 920, for joints in vertical surfaces:
 - a. Exterior use.
 - b. Exterior and interior use.
 - 1. Type and Application: One-part mildew-resistant silicone sealant, ASTM C 920, for sanitary applications, interior use.
- C. Polysulfide Elastomeric Joint Sealants:
- 1. Manufacturers: W. R. Meadows, Pecora Corp., Sonneborn Building Products or approved equal.
 - 2. Type and Application: Two-part nonsag polysulfide sealant, ASTM C 920, for joints in vertical surfaces:
 - a. Exterior use.
 - b. Exterior and interior use.
 - 3. Type and Application: Two-part pourable polysulfide sealant, ASTM C 920, for joints in horizontal surfaces:
 - a. Exterior use.
 - b. Exterior and interior use.
 - 4. Type and Application: Two-part polysulfide sealant, ASTM C 920, for water immersion.
- D. Latex Joint Sealants:
- 1. Manufacturers: Pecora Corporation, Polymeric Systems, Inc., Sonneborn Building Products, Tremco, or approved equal.
 - 2. Type: Acrylic-emulsion, ASTM C 834.
 - 3. Type: Silicone emulsion, ASTM C 834, and ASTM C 920.
 - 4. Application: Interior joints in vertical and overhead surfaces with limited movement.
- E. Solvent-Release-Curing Joint Sealants:
- 1. Manufacturers: H.B. Fuller Company, Pecora Corporation, Polymeric Systems, Inc., Sonneborn Building Products, Tremco, or approved equal.
 - 2. Type: Acrylic, ASTM C 920.
 - 3. Type: Butyl, FS TT-S-001657.
 - 4. Application: Exterior vertical surfaces with limited movement.
- F. Compression Seals:
- 1. Type: Preformed foam sealant.
 - 2. Type: Preformed hollow neoprene gasket, ASTM D 2628.
 - 3. Application: Wide exterior joints in vertical surfaces.
- G. Fire-Resistive Joint Sealers:
- 1. Type: Foamed-in-place fire-stopping sealants.
 - 2. Type: One part fire-stopping sealant.
 - 3. Application: Penetrations in fire-rated floor and wall assemblies.

H. Specialty Sealants:

1. Type and Application: Synthetic rubber for acoustical sealant for concealed joints.
2. Type and Application: Butyl-polyisobutylene sealant and tape sealant for concealed joints.

I. Paving Joint Fillers:

1. Type: Self-expanding cork.
2. Type: Cork.
3. Type: Sponge rubber.
4. Type: Bituminous fiber.
5. Application: Filler for exterior paving joints.

J. Auxiliary Materials:

1. Plastic foam joint fillers.
2. Elastomeric tubing backer rods.
3. Bond breaker tape.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.
- B. Provide sealants in colors as selected from manufacturer's standards.
- C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Clean and prime joints, and install bond breakers, backer rods and sealant as recommended by manufacturers.
- D. Depth shall equal width up to 1/2 inch wide; depth shall equal 1/2 width for joints over 1/2 inch wide.
- E. Cure and protect sealants as directed by manufacturers. Replace or restore damaged sealants. Clean adjacent surfaces to remove spillage.

END OF SECTION

SECTION 08120

INTERIOR ALUMINUM DOOR AND SIDELIGHT FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide interior aluminum doors and frames.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Source: Provide products of one manufacturer for each type of frame required for the work of this section. Provide secondary materials and products, which are acceptable to the frame manufacturers.
- C. Performance Standards:
 - 1. Fire-Rated Assemblies: NFPA 80, and acceptable testing agency listing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Frameworks Manufacturing Co., Inc., Raco Altura, Wilson Partitions, or approved equal.
- B. Aluminum Doors and Sidelight Frames.
 - 1. Aluminum: Extruded aluminum 6063 or 6463-T5 alloy.
 - 2. Frame Type: KD, knock-down type, machined for mortised hardware; field machining and drilling not acceptable.
 - 3. Anchors and Fasteners: Manufacturer's standard units.
 - 4. Finish: Clear anodized.
 - 5. Finish: Color anodized.
 - 6. Finish: Powder coated.
 - 7. Finish: High-Performance Organic Finish, 2-Coat 70% Fluoropolymer.
 - 8. Finish: Mill for field painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fabricate work to be rigid, neat and free from seams, defects, dents, warp, buckle, and exposed fasteners.
- B. Install fire rated frames in compliance with, NFPA 80, and requirements of authorities having jurisdiction.
- C. Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single doorframes; 2 on double doorframes.

END OF SECTION

SECTION 08163
ALUMINUM SLIDING GLASS DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide aluminum sliding glass doors for exterior exposure.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- D. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
 - 2. Warranty Period: 10 years.
- E. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Amarlite Architectural Products, EFCO Corp., Kawneer Company or approved equal.
- B. Aluminum Sliding Glass Doors: AAMA/NWWDA 101/I.S.2.
 - 1. Frame and Panels: Aluminum extrusions, minimum 0.062 inch thick, thermal-break type.
 - 2. Performance Class and Grade: Residential R20.
 - 3. Performance Class and Grade: Commercial C 35.
 - 4. Performance Class and Grade: Heavy Commercial HC50.
 - 5. Glass and Glazing: Single pane safety glazing, 16 CFR 1201.
 - 6. Glass and Glazing: Insulating safety glazing, 16 CFR 1201.
 - 7. Glass: Clear.
 - 8. Glass: Clear with Low-E.
 - 9. Glass: Tinted glass.

10. Finish: Clear anodized.
11. Finish: Color anodized.
12. Finish: Baked enamel.
13. Finish: High-Performance Organic Finish, 2-Coat 70% Fluoropolymer.
14. Finish: High-Performance Organic Finish, 3-Coat 70% Fluoropolymer.

C. Auxiliary Materials:

1. Insect screens.
2. Locks, door pulls, and roller assemblies.
3. Compression and sliding weatherstripping.
4. Aluminum or non-magnetic stainless steel fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Install assemblies complete with all hardware, anchors, inserts, supports and accessories. Test and adjust operation.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 08520
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide aluminum windows.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- D. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
- E. Maintenance Data: Submit manufacturer's maintenance data, including maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
- C. Performance: Comply with AAMA/NWWDA 101/I.S.2 for grade of window required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: EFCO Corp., Graham Architectural Products, Peerless Products, Wausau Metals, or approved equal.
- B. Aluminum Windows:
 - 1. Construction: Thermal-break type.
 - 2. Aluminum Window Members: Aluminum extrusions.
 - 3. Anchors, Clips, and Window Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.
 - 4. Window Operation: Awning windows.
 - 5. Window Operation: Casement windows.
 - 6. Window Operation: Double-hung windows.

7. Window Operation: Horizontal sliding windows.
 8. Window Operation: Projected windows.
 9. Window Operation: Jalousie windows.
 10. Window Operation: Top-hinged in swing windows.
 11. Window Operation: Vertical pivoted windows.
 12. Window Operation: Fixed windows.
 13. Performance Class and Grade:
 - a. Residential 25
 - b. Commercial 40
 - c. Heavy Commercial 55
 - d. Architectural 60.
 14. Glazing: Single pane glass.
 15. Glazing: Insulating glass.
 16. Glazing Color: Clear glass.
 17. Glazing Color: Tinted glass.
 18. Glazing: Clear with Low-E.
 19. Aluminum Finish: Clear anodized.
 20. Aluminum Finish: Color anodized.
 21. Aluminum Finish: Baked enamel.
 22. Aluminum Finish: High-Performance Organic Finish, 2-Coat 70% Fluoropolymer.
 23. Aluminum Finish: High-Performance Organic Finish, 3-Coat 70% Fluoropolymer.
- C. Auxiliary Materials:
1. Ventilator opening limit device.
 2. Window cleaner's bolts.
 3. Operating hardware.
 4. Insect screening.
 5. Integral venetian blinds.
 6. Nonglazed vent bar.
 7. Exterior louver units.
 8. Group operating system, manual operation.
 9. Group operating system, power driven operation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fabricate windows to conform to AAMA standards and accept glass specified.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Operation: Provide locking units with manual operation; provide pole for out of reach hardware.
- D. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 08550
WOOD WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wood windows.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- D. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
- E. Maintenance Data: Submit manufacturer's maintenance data, including maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
- C. Performance: Comply with AAMA/NWWDA 101/I.S.2 for performance class and grade of window required.
 - 1. Residential: Grade 20.
 - 2. Light Commercial: Grade 40.
 - 3. Heavy Duty Commercial: Grade 60.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Andersen Windows, Caradco, Malta Wood Windows & Doors, Marvin Windows & Doors, Pella, Weather Shield, or approved equal.
- B. Wood Windows:
 - 1. Wood Window Members: Kiln-dried clear ponderosa pine or suitable fine-grain lumber.
 - 2. Anchors, Clips, and Window Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.

3. Window Type: Prime-coated wood windows.
4. Window Type: Aluminum-clad wood windows.
5. Window Type: Vinyl-clad wood windows.
6. Window Operation: Awning windows.
7. Window Operation: Casement windows.
8. Window Operation: Double-hung windows.
9. Window Operation: Horizontal sliding windows.
10. Window Operation: Fixed windows.
 - a. Bay window
11. Window Operation: Decorative windows.
12. Glazing: Single pane glass.
13. Glazing: Insulating glass.
14. Glazing Color: Clear glass.
15. Glazing Color: Tinted glass.
16. Glass: Clear with Low-E.
17. Glazing Pattern: Single pane per sash.
18. Glazing Pattern: Single pane per sash with snap on trim.
19. Glazing Pattern: True divided lites.
20. Aluminum Cladding: Formed or extruded aluminum cladding mechanically bonded to sash and frame with baked enamel finish.
21. Vinyl Cladding: PVC, ASTM D 1784, bonded to wood members.
22. Interior Wood Finish: Factory primed for site finish.
23. Interior Wood Finish: Natural finish for site finish.
24. Interior Wood Finish: Factory finished.

C. Auxiliary Materials:

1. Ventilator opening limit device.
2. Operating hardware.
3. Insect screening.
4. Integral venetian blinds.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 08710
DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide door hardware.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Submit for approval hardware schedule proposed for use based on Owner's requirements.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Hardware for Fire-Rated Openings: NFPA 80, and local requirements.
- C. Materials and Application: ANSI A156 series standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Corbin Russwin Architectural Hardware, Sargent Manufacturing, Schlage Lock Co., Yale Locks and Hardware, or approved equal.
- B. Door Hardware:
 - 1. Quality Level: Residential.
 - 2. Quality Level: Commercial.
 - 3. Quality Level: Heavy duty commercial.
 - 4. Locksets and Latchsets: Cylinder type.
 - 5. Locksets and Latchsets: Mortise type.
 - 6. Lock Cylinders: Integral.
 - 7. Lock Cylinders: Interchangeable.
 - 8. Keying: Owner's requirements.
 - 9. Keying: Multiple building keying and key control system.
 - 10. Keying: Match existing keying and key control system.
 - 11. Hinges and Butts: Full-mortise type with nonremovable pins at exterior doors.
 - 12. Closers, Door Control, and Exit Devices: Low frequency.
 - 13. Closers, Door Control, and Exit Devices: High frequency.
 - 14. Closers, Door Control, and Exit Devices: Barrier-free.

15. Pivots: Offset or center-hung type.
 16. Push/Pull Units: Through-bolted type.
 17. Hardware Finishes: Bright brass finish on exposed surfaces.
 18. Hardware Finishes: Satin brass finish on exposed surfaces.
 19. Hardware Finishes: Oxidized satin brass finish on exposed surfaces.
 20. Hardware Finishes: Polished chrome finish on exposed surfaces.
 21. Hardware Finishes: Satin chrome finish on exposed surfaces.
 22. Hardware Finishes: Polished stainless finish on exposed surfaces.
 23. Hardware Finishes: Satin stainless finish on exposed surfaces.
- C. Auxiliary Materials:
1. Door Trim Units: Kickplates, edge trim, viewers, knockers, and mail drops. and related trim.
 2. Stops and overhead door holders.
 3. Interior sliding door hardware.
 4. Interior bifold door hardware.
 5. Interior pocket door hardware.
 6. Soundstripping.
 7. Weatherstripping and thresholds.
 8. Electromagnetic hold-open devices.
 9. Card-operated opening devices.
 10. Knox box for fire emergency keys.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow guidelines of DHI "Recommended Locations for Builder's Hardware and hardware manufacturers' instructions.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Adjust operation, clean and protect.

END OF SECTION

SECTION 09210
GYPSUM PLASTER

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum plaster systems for interior application.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers of Gypsum Plaster: National Gypsum Co., United States Gypsum Co., or approved equal.
- B. Gypsum Plaster:
 - 1. Base Coat Plasters: ASTM C 28.
 - 2. Aggregates: ASTM C 35.
 - 3. Finishing Hydrated Lime: ASTM C 206.
 - 4. Finish Coat Plasters: ASTM C 28, gypsum gauging plaster.
 - 5. Finish Coat Plasters: ASTM C 28, high-strength gypsum gauging plaster.
 - 6. Finish Coat Plasters: Ready-mixed finish plaster.
 - 7. Application: 2 coats over metal lath substrate.
 - 8. Application: 2 coats over gypsum lath substrate.
 - 9. Application: 2 coats over unit masonry substrate.
 - 10. Application: 2 coats over concrete substrate.
 - 11. Application: 2 coats over gypsum lath substrate.
 - 12. Application: 2 coats over unit masonry substrate.
 - 13. Finish: Toweled finish.
 - 14. Finish: Floated finish.
- C. Auxiliary Materials:
 - 1. Corner beads, casing bead, and control joints.
 - 2. Bonding compounds and agents.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Machine mix plaster and trowel-on to provide smooth and dense finish surface, except as otherwise indicated. Continue finish behind furniture, casework and similar removable items; finish may be omitted from permanently concealed surfaces.
- B. Install gypsum plaster in accordance with ASTM C 842, and in accordance with manufacturer's instructions.
- C. At plaster patching, prepare surface to sound substrate, apply bonding agent and patching materials in accordance with manufacturer's instructions.
- D. Install metal trims at perimeters and joints. At scratch coat form full keys. Ensure tight contact between coats. Tool edges at windows, doors, other openings to small vee to control spalling.
- E. Clean adjacent surfaces soiled during installation. Touch-up damaged surfaces. Protect work from damage.

END OF SECTION

SECTION 09220
PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide portland cement plaster for exterior applications.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement Plaster:
 - 1. Cement: Portland cement, ASTM C 150, Type I or II.
 - 2. Application: 3 coats over metal lath.
 - 3. Application: 3 coats over concrete unit masonry.
 - 4. Application: 2 coats over concrete unit masonry.
 - 5. Finish Coat: Job-mixed finish coat.
 - 6. Finish Coat: Factory-prepared finish coat.
 - 7. Finish: Troweled finish.
 - 8. Finish: Floated finish.
- B. Auxiliary Materials:
 - 1. Corner beads, casing bead, and control joints.
 - 2. Bonding compounds and agents.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Portland cement plaster in accordance with ASTM C 926, and manufacturer's instructions.
- B. At plaster patching, prepare surface to sound substrate, apply bonding agent and patching materials in accordance with manufacturer's instructions.
- C. Install metal trims at perimeters and joints. At scratch coat form full keys. Ensure tight contact between coats. Tool edges at windows, doors, other openings to small vee to control spalling.

- D. Clean adjacent surfaces soiled during installation. Touch-up damaged surfaces. Protect work from damage.

END OF SECTION

SECTION 09253
GYPSUM SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum sheathing at exterior of studs at exterior walls.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Paper-Surfaced Gypsum Sheathing Board: ASTM C 79:
 - 1. Type: Regular and fire-rated types:
 - a. 1/2-inch typical thickness.
 - a. 5/8-inch typical thickness.
 - 2. Construction: Untreated core gypsum sheathing board.
 - 3. Manufacturers: Georgia-Pacific, National Gypsum Co., United States Gypsum, or approved equal.
- B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177
 - 1. Type: Regular and fire-rated types:
 - a. 1/2-inch typical thickness.
 - b. 5/8-inch typical thickness.
 - 2. Product: Dens-Glass Gold by G-P Gypsum Corp.
- C. Auxiliary Materials:
 - 1. Asphalt-saturated organic felt, ASTM D 226, Type I, No. 15, unperforated air infiltration barrier.
 - 2. Building Wrap: ASTM E 1677, Type I, DuPont Tyvek Commercial Wrap, or approved equal.
 - 3. Fasteners, Type S steel drill screws with corrosion-resistant finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturers instructions and recommendations.

- B. Install gypsum sheathing horizontally. Fit tightly around obstructions, but allow for building expansion and structural movement.
- C. Provide felt paper horizontally over sheathing, overlapping edges at least 3 inches.
- D. Provide air infiltration barrier over sheathing, overlapping edges at least 2 inches and tape seams with sheathing tape.
- E. Seal perimeter of system and at interface with other materials.
- F. For brick veneer and steel stud applications, after installation of masonry veneer anchors, coat each screw head and each veneer anchor screw with heavy dab of asphalt emulsion mastic.

END OF SECTION

SECTION 09260
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum board assemblies:
 - 1. Interior walls, partitions, and ceilings with tape and joint compound finish.
 - 2. Interior walls, partitions and ceilings with veneer plaster finish.
 - 3. Exterior ceilings and soffits.
 - 4. Steel framing systems to receive gypsum board.
 - 5. Insulation and vapor barrier systems in gypsum board assemblies.
 - 6. Cementitious backer units for application of tile.
 - 7. Glass-reinforced gypsum fabrications.
 - 8. Remodeling at existing gypsum board construction.
 - 9. Installation of access panels in gypsum board assemblies.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Tolerances: Not more than 1/16-inch difference in true plane at joints between adjacent boards before finishing. After finishing, joints shall be not be visible. Not more than 1/8 inch in 10 feet deviation from true plane, plumb, level and proper relation to adjacent surfaces in finished work.
- C. Fire Resistance for Fire-Rated Assemblies: ASTM E 119.
- D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship and level of finish.
- E. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers of Gypsum Board: Georgia-Pacific Corp., LaFarge North America, National Gypsum Co., United States Gypsum Co., or approved equal.
- B. Manufacturers of Steel Framing and Furring: Dale Inco, Dietrich Industries, Marino Ware, National Gypsum Co., Unimast, or approved equal.

- C. Manufacturers of Grid and Suspension Systems: Armstrong World Industries, Chicago Metallic, United States Gypsum Co., or approved equal.
- D. Gypsum Board:
 - 1. Gypsum Wallboard for Tape and Joint Compound Finish: ASTM C 36, regular, moisture-resistant, foil-backed, and fire-rated types as required:
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 2. Gypsum Wallboard for Veneer Plaster Finish: ASTM C 588, regular, moisture-resistant, foil-backed, and fire-rated types as required:
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 3. Water-Resistant Gypsum Backing Board: ASTM C 630, regular and fire-rated types as required:
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 4. Flexible Gypsum Wallboard: ASTM C 36 for curved surfaces, regular
 - a. Typical thickness: 1/4 inch.
 - 5. Sag-Resistant Gypsum Wallboard: ASTM C 36, for ceilings.
 - a. Thickness: 1/2 inch.
 - 6. Exterior Gypsum Soffit Board: ASTM C 931, regular and fire-rated types as required:
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 7. Proprietary Abuse-Resistant Gypsum Wallboard: ASTM C 36.
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 8. Vinyl-Film-Faced Gypsum Board ASTM C 960, Class I, with 8-mil facing wrapped around panel long edges.
 - a. Typical Thickness: 1/2 inch.
 - b. Typical Thickness: 5/8 inch.
 - 9. Joint Treatment: ASTM C 475 and ASTM C 840, 3-coat system, paper or fiberglass tape.
- E. Veneer Plaster:
 - 1. Plaster: ASTM C 587, one-coat veneer plaster:
 - a. Type: Regular.
 - b. Type: High-strength.
 - c. Type: Radiant heat.
 - 2. Plaster: ASTM C 587, two-coat veneer plaster:
 - a. Type: Regular.
 - b. Type: High-strength.
 - c. Type: Radiant heat.
 - 3. Joint Reinforcing Materials: ASTM C 587.
- F. Glass-Mat Water-Resistant Gypsum Backing Board:
 - 1. Type: ASTM C 1178, regular, 1/2 inch thick.
 - 2. Type: ASTM C 1178, Type X, 5/8 inch thick.
- G. Cementitious Backer Units:
 - 1. Type: ANSI A118.9, cement-coated Portland cement panels.
 - 2. Thickness: 1/2 inch nominal.
- H. Trim Accessories:
 - 1. Material: Metal trim
 - 2. Material: Plastic trim.
 - 3. Material: Metal or plastic trim.

4. Types: Cornerbead, edge trim, and control joints.
 5. Decorative Profiles: Extruded aluminum reveals and channels, with factory-applied primer.
- I. Steel Framing for Walls and Partitions:
1. Steel Studs and Runners: ASTM C 645 [ASTM A 653, G60, hot-dip galvanized] [Manufacturer's standard corrosion-resistant zinc] coating.
 - a. Thickness: 20 gauge (.0329 inch).
 - b. Thickness: 22 gauge (.0276 inch).
 - c. Thickness: 25 gauge (.0179 inch).
 - d. Typical Depth: 2-1/2 inch.
 - e. Typical Depth: 3-5/8 inch.
 - f. Typical Depth: 4 inch.
 - g. Typical Depth: 6 inch.
 2. Furring Channels: ASTM C 645 [ASTM A 653, G60, hot-dip galvanized] [Manufacturer's standard corrosion-resistant zinc] coating.
 - a. Thickness: 20 gauge (.0329 inch).
 - b. Thickness: 25 gauge (.0179 inch).
 3. Auxiliary Framing Components: Furring brackets, resilient furring channels, Z-furring members, and non-corrosive fasteners.
- J. Steel Framing for Suspended and Furred Ceilings:
1. Furring Channels: ASTM C 645 [ASTM A 653, G60, hot-dip galvanized] [Manufacturer's standard corrosion-resistant zinc] coating:
 - a. Type: Standard.
 - b. Type: Resilient.
 - c. Thickness: 20 gauge (.0329 inch).
 - d. Thickness: 25 gauge (.0179 inch).
 2. Accessories: Hangers and inserts.
- K. Glass-Reinforced Gypsum Fabrications:
1. Fabrications: ASTM C 1355
 2. Embedments: Cold-rolled steel channels with ASTM A 653, G60 hot-dip galvanized coating.
 3. Glass Fibers: ASTM D 578, Type E glass.
 4. Finish: Surface suitable for paint finish.
- L. Auxiliary Materials:
1. Gypsum board screws, ASTM C 1002.
 2. Gypsum board nails, ASTM C 514.
 3. Fastening adhesive.
 4. Concealed acoustical sealant.
 5. Mineral fiber sound attenuation blankets.
 6. Mineral fiber thermal insulation.
 7. Polyethylene vapor retarder, 6 mils.
 8. Polystyrene aggregated finish for ceilings.
 9. Acoustical Finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Framing: Install steel framing in compliance with ASTM C 754. Install with tolerances necessary to produce substrate for gypsum board assemblies with tolerances specified. Include blocking for items such as railings, grab bars, casework, toilet accessories and similar items.

- B. Wood Framing: Install wood framing in compliance with Section 06100 - Rough Carpentry. Install with tolerances necessary to produce substrate for gypsum board assemblies with tolerances specified. Include blocking for items such as railings, grab bars, casework, toilet accessories and similar items.
- C. Install gypsum board for tape and 3-coat joint compound finish in compliance with ASTM C 840 and GA 216, Recommended Specifications for the Application and Finishing of Gypsum Board. Install gypsum board assemblies true, plumb, level and in proper relation to adjacent surfaces.
- D. Install gypsum board for veneer plaster finish in compliance with ASTM C 844. Install gypsum board assemblies true, plumb, level and in proper relation to adjacent surfaces.
- E. Provide continuous vapor retarder at exterior walls.
- F. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
- G. Install boards vertically. Do not allow butt-to-butt joints and joints that do not fall over framing members.
- H. Where new partitions meet existing construction, remove existing cornerbeads to provide a smooth transition.
- I. Provide insulation full height and thickness in partitions at conference rooms, toilet rooms, between different occupancies, and where required.
- J. Provide acoustical sealant at both faces at top and bottom runner tracks, wall perimeters, openings, expansion and control joints.
- K. Install trim in strict compliance with manufacturer's instructions and recommendations.
- L. Repair surface defects. Leave ready for finish painting or wall treatment.

END OF SECTION

SECTION 09263

GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum board shaft-wall assemblies.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Georgia Pacific, National Gypsum Co., Lafarge North America, United States Gypsum Company, or approved equal.
- B. Cavity Shaft Wall Assemblies:
 - 1. Shaft Wall Board Thickness: Not less than 3/4 inch.
 - 2. Shaft Wall Board Thickness: Not less than 1 inch.
 - 3. Studs: I, C-H or double E studs, not less than 20 gauge (.0329 inch).
 - 4. Studs: I, C-H or double E studs, not less than 22 gauge (.0276 inch).
 - 5. Studs: I, C-H or double E studs, not less than 25 gauge (.0179 inch).
- C. Gypsum Board Shaft Wall Materials:
 - 1. Steel Framing: ASTM C 645 [ASTM A 653, G40, hot-dip galvanized] [Manufacturer's standard corrosion-resistant zinc] coating.
 - 2. Gypsum Shaft Wall Board: ASTM C 442, Type X.
 - 3. Gypsum Wallboard: ASTM C 36, Type X.
 - 4. Gypsum Base for Veneer Plaster: ASTM C 588, Type X.
 - 5. Water-Resistant Gypsum Backing Board: ASTM C 630, Type X.
 - 6. Gypsum Wallboard Joint Treatment Materials: ASTM C 475 and ASTM C 840.
 - 7. Veneer Plaster Joint Reinforcing Materials: ASTM C 587.
- D. Auxiliary Materials:
 - 1. Cornerbeads, edge trim, and control joints.
 - 2. Laminating adhesive.
 - 3. Gypsum board screws, ASTM C 1002.

4. Concealed acoustical sealant.
5. Mineral fiber sound attenuation blankets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with shaft wall manufacturer's recommendations, ASTM C 840 and GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
- B. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
- C. Install trim and 3-coat joint treatment in strict compliance with manufacturer's instructions and recommendations. Joint treatment is required at all fasteners and edges between boards. Fill all surface defects. Sand between and after joint treatment coatings and leave ready for finish painting or wall treatment.

END OF SECTION

SECTION 09300

TILE

PART 1 - GENERAL

1.1 SUMMARY

- A. Interior Tile:
 - 1. Wall tile over gypsum wallboard.
 - 2. Wall tile over tile backer board at wet areas.
 - 3. Wall tile over concrete and concrete masonry units.
 - 4. Floor tile over concrete slab.
 - 5. Floor tile over plywood and wood decking.
- B. Exterior Tile:
 - 1. Wall tile on concrete or masonry backup.
 - 2. Wall tile on tile backer board.
 - 3. Floor tile on slab-on-grade.
 - 4. Floor tile on suspended slabs.
- C. Special Purpose Tile:
 - 1. Fountains.
 - 2. Swimming pools.
 - 3. Steam rooms.
 - 4. Cold rooms.
- D. Remodeling of existing tile work.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
 - 1. Include manufacturer's full range of color and finish options if additional selection is required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Tile: ANSI A 137.1.
- C. Tile Setting Materials: ANSI A 118 series standard specifications.
- D. Tile Installation: ANSI 108 series standard specifications and Tile Council of America, Handbook for Ceramic Tile Installation.
- E. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers of Tile: American Olean, Dal-Tile, Summitville Tiles, United States Ceramic Tile Co. or approved equal.
- B. Manufacturers of Setting Materials: American Olean, Construction Products, Custom Building Products, Laticrete, Mapei Corp, or approved equal.
- C. Unglazed Ceramic Mosaic Tile:
 - 1. Thickness: 1/4 inch nominal.
 - 2. Size: 1 by 1 inches.
 - 3. Size: 1 by 2 inches.
 - 4. Size: 2 by 2 inches.
 - 5. Type: Porcelain factory-mounted flat tile:
 - a. Abrasive admixture.
 - 6. Type: Natural clay factory-mounted flat tile:
 - a. Abrasive admixture.
 - 7. Type: Conductive factory-mounted flat tile:
 - a. Abrasive admixture.
 - 8. Face: Plain face with cushion edges.
 - 9. Face: Patterned face with cushion edges.
- D. Glazed Ceramic Mosaic Tile:
 - 1. Thickness: 1/4 inch nominal.
 - 2. Size: 1 by 1 inches.
 - 3. Size: 1 by 2 inches.
 - 4. Size: 2 by 2 inches.
 - 5. Type: Porcelain factory-mounted flat tile.
 - 6. Type: Natural clay factory-mounted flat tile.
 - 7. Face: Plain face with cushion edges.
 - 8. Face: Patterned face with cushion edges.
- E. Glazed Wall Tile:
 - 1. Thickness: 5/16-inch nominal thickness.
 - 2. Size: 4-1/4 by 4-1/4 inches.
 - 3. Size: 6 by 6 inches.
 - 4. Type: Interior type body, flat tile.
 - 5. Face: Plain face with modified square edge.
 - 6. Face: Plain face with cushion edge.
 - 7. Face: Patterned face with standard edge.
- F. Unglazed Quarry Tile:
 - 1. Thickness: 3/8 inch. nominal.
 - 2. Thickness: 1/2 inch nominal.
 - 3. Thickness: 3/4 inch nominal.
 - 4. Size: 4 by 4 inches.
 - 5. Size: 6 by 6 inches.
 - 6. Size: 8 by 8 inches.
 - 7. Type: Abrasive. square-edged flat tile.
 - 8. Type: Nonabrasive square-edged flat tile.
 - 9. Face: Plain face.
 - 10. Face: Patterned face.

G. Glazed Quarry Tile:

1. Thickness: 3/8 inch nominal.
2. Thickness: 1/2 inch nominal.
3. Thickness: 3/4 inch nominal.
4. Size: 4 by 4 inches.
5. Size: 6 by 6 inches.
6. Size: 8 by 8 inches.
7. Type: Abrasive, square-edged flat tile.
8. Type: Nonabrasive square-edged flat tile.
9. Face: Plain face.
10. Face: Patterned face.

H. Unglazed Paver Tile:

1. Thickness: 3/8 inch nominal.
2. Thickness: 1/2 inch nominal.
3. Thickness: 3/4 inch nominal.
4. Size: 4 by 4 inches.
5. Size: 6 by 6 inches.
6. Size: 8 by 8 inches.
7. Type: Porcelain flat tile.
8. Type: Natural clay flat tile.
9. Face: Plain face with square edges.
10. Face: Plain face with cushion edges.

I. Glazed Paver Tile:

1. Thickness: 3/8 inch, nominal.
2. Thickness: 1/2 inch nominal.
3. Thickness: 3/4 inch nominal.
4. Size: 4 by 4 inches.
5. Size: 6 by 6 inches.
6. Size: 8 by 8 inches.
7. Type: Porcelain flat tile.
8. Type: Natural clay flat tile.
9. Face: Plain face with square edges.
10. Face: Plain face with cushion edges.

J. Tile Accessories:

1. Matching trim units.
2. Marble thresholds.
3. Stone thresholds.
4. Metal edge strips.
5. Ceramic toilet accessories without handles.

K. Setting Materials:

1. Dry-set Portland cement mortar.
2. Latex-Portland cement mortar.
3. Conductive dry-set mortar.
4. Chemical-resistant epoxy adhesive.
5. Chemical-resistant furan mortar.
6. Modified epoxy emulsion mortar.
7. Organic adhesive.

L. Grout:

1. Sand-Portland cement grout.
2. Dry-set grout.

3. Latex-Portland cement grout.
4. Chemical-resistant epoxy grout.
5. Chemical-resistant furan resin grout.
6. Silicone rubber elastomeric grout for pregrouted sheets.

M. Setting Accessories:

1. Waterproofing membrane under tile, ANSI A 118.10.
2. Crack suppression membrane under tile, ANSI A 118.10.
3. Cementitious tile backer board, ANSI A 118.9.

N. Elastomeric Sealants:

1. One-part mildew-resistant silicone sealant for non-traffic areas.
2. Multi-part pourable urethane sealant for traffic areas.
3. Chemical-resistant sealant at chemical-resistant flooring.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with Tile Council of America and ANSI Standard Specifications for Installation for substrate and installation required. Comply with manufacturer's instructions and recommendations.
- B. Install waterproof membrane in accordance with manufacturer's instructions and recommendations.
- C. Lay tile in grid pattern with alignment grids. Layout tile to provide uniform joint widths and to minimize cutting; do not use less than 1/2 tile units.
- D. Provide sealant joints where recommended by TCA and approved by Architect.
- E. Grout and cure, clean and protect.

3.2 SCHEDULE

- A. Tile Schedule: [Insert here -- following are examples only]
 1. Toilet Room Walls: Glazed ceramic mosaic tile over tile backer board with thin-set latex-modified cement mortar and latex-Portland cement grout.
 2. Toilet Room Floors: Unglazed ceramic mosaic tile over concrete slab with latex-Portland cement mortar and latex-Portland cement grout.

END OF SECTION

SECTION 09511
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide acoustical lay-in panel ceilings and exposed metal suspension system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Extra Stock: Submit extra stock equal to 2% of amount installed.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities. Acoustical performance based on project requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Armstrong World Industries, Celotex, USG, or approved equal.
- B. Mineral Base Panels, Nodular, Cast or Molded Type:
 - 1. Size: 24 by 24 inches by 3/4 inch.
 - 2. Size: 24 by 48 inches by 3/4 inch.
 - 3. Edge Detail: Square edge.
 - 4. Edge Detail: Reveal edge.
 - 5. Pattern: Fissured.
 - 6. Pattern: Fissured and heavily textured.
 - 7. Pattern: Heavily textured.
 - 8. Pattern: Lightly textured.
 - 9. Pattern: Lightly textured and scored pattern.
 - 10. Type and Form: Type III, mineral base with painted finish ASTM E 1264; Form 1, nodular or Form 4, cast or molded.
 - 11. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 1, nodular; with washable vinyl-film overlay.
- C. Mineral Base Panels, Water Felted:
 - 1. Size: 24 by 24 inches.

2. Size: 24 by 48 inches.
 3. Size: 24 by 60 inches.
 4. Thickness: 5/8 inch.
 5. Thickness: 3/4 inch.
 6. Thickness: 7/8 inch.
 7. Pattern: Perforated panel.
 8. Pattern: Perforated and fissured.
 9. Pattern: Perforated and lightly textured.
 10. Pattern: Perforated, fissured and scored pattern.
 11. Pattern: Fissured and scored pattern.
 12. Edge: Square.
 13. Edge: Reveal.
 14. Edge: Tapered.
 15. Type and Finish: Painted finish, ASTM E 1264, Type III, Form 2.
- D. Mineral Base Panels, Dry Felted With Painted Finish:
1. Pattern and Edge: Lightly textured with square edge.
 2. Type: ASTM E 1264, Type III, Form 3.
 3. Size: 24 by 48 inches.
 4. Size: 24 by 24 inches.
 5. Size: 24 by 48 inches.
 6. Thickness: 1 inch.
 7. Thickness: 1-1/2 inches.
- E. Mineral Base Panels With Membrane Faced Overlay:
1. Type and Finish: ASTM E 1264, Type IV with vinyl-coated finish.
 2. Thickness: 5/8 inch.
 3. Thickness: 3/4 inch.
 4. Size: 24 by 24 inches.
 5. Size: 24 by 48 inches.
 6. Pattern and Edge: Perforated and lightly textured/smooth pattern with square edge.
 7. Pattern and Edge: Lightly textured/smooth pattern with square edge.
- F. Glass Fiber Base Panels With Plastic Membrane Facing:
1. Type and Form: ASTM E 1264, Type XII, Form 1.
 2. Size: 24 by 24 inches.
 3. Size: 24 by 48 inches.
 4. Size: 48 by 48 inches.
 5. Thickness: 5/8 inch.
 6. Thickness: 1 inch.
 7. Thickness: 1-1/2 inches.
 8. Pattern and Edge: Perforated and lightly textured pattern with square edge.
 9. Pattern and Edge: Lightly textured pattern with square edge.
- G. Glass Fiber Base Panels With Cloth Membrane-Faced Overlay:
1. Type and Form: ASTM E 1264, Type XII, Form 2.
 2. Size: 24 by 24 inches.
 3. Size: 24 by 48 inches.
 4. Size: 20 by 60 inches.
 5. Size: 30 by 60 inches.
 6. Size: 48 by 96 inches.
 7. Size: 60 by 60 inches.
 8. Thickness: 3/4 inch.
 9. Thickness: 1 inch.
 10. Thickness: 1-1/2 inches.
 11. Pattern: Lightly textured.

12. Pattern: Smooth.
 13. Edge: Square.
 14. Edge: Reveal.
- H. High-Density Ceramic Base Panels With Scrubbable Finish:
1. Type: ASTM E 1264, Type XX.
 2. Size: 24 by 24 inches by 5/8 inches.
 3. Size: 24 by 48 inches by 5/8 inches.
 4. Pattern and Edge: Perforated and fissured pattern with square edge.
 5. Pattern and Edge: Smooth pattern with square edge.
- I. Direct-Hung Suspension Systems, Non-Fire-Resistance Rated:
1. Type: Wide-face, single-web steel, ASTM C 635.
 2. Type: Wide-face, capped double-web steel, ASTM C 635.
 3. Type: Wide-face, capped double web galvanized steel, ASTM C 635.
 - a. G60 galvanizing.
 - b. G90 galvanizing.
 4. Type: Wide-face, double-web stainless steel, intermediate duty classification, ASTM C 635.
 5. Type: Narrow-face, capped double-web steel, ASTM C 635.
 6. Type: Narrow-face uncapped double-web steel, ASTM C 635.
 7. Classification: Intermediate duty.
 8. Classification: Heavy duty.
 9. Suspension System Accessories: Attachment devices and hangers, ASTM C 635.
 10. Cap Material: Painted steel finish.
 11. Cap Material: Painted aluminum finish.
 12. Cap Material: Natural aluminum finish.
- J. Direct-Hung Suspension Systems, Fire-Resistance Rated:
1. Type: Wide-face, capped double-web steel, ASTM C 635.
 2. Type: Wide-face, capped double web galvanized steel, ASTM C 635.
 - a. G60 galvanizing.
 - b. G90 galvanizing.
 3. Type: Narrow-face, capped double-web steel, ASTM C 635.
 4. Type: Narrow-face uncapped double-web steel, ASTM C 635.
 5. Suspension System Accessories: Attachment devices and hangers, ASTM C 635.
 6. Cap Material: Painted steel finish.
 7. Cap Material: Painted aluminum finish.
 8. Cap Material: Natural aluminum finish.
- K. Auxiliary Materials:
1. Edge molding and trim.
 2. Hold-down clips and impact clips.
 3. Concealed acoustical sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and suspension systems in accordance with manufacturer's instructions and recommendations, and ASTM C 636. Coordinate installation with location of mechanical and electrical work to ensure proper locations and anchorage.
- B. Level ceiling to within 1/8" in 10' in both directions. Scribe and cut panels to fit accurately. Measure and layout to avoid less than half panel units.

- C. Removal and reinstallation at existing ceilings: Remove and store materials for reuse when allowed. Handle with white gloves and avoid damaging corners and edges. Clean tiles and grid system, which have been removed. Provide additional materials to complete the work and to replace damaged existing materials. New materials shall match existing materials as approved.
- D. Adjust, clean, and touch-up all system components.

END OF SECTION

SECTION 09512
ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide acoustical tile ceilings and concealed metal suspension system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Extra Stock: Submit extra stock equal to 2% of amount installed.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities. Acoustical performance based on project requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Armstrong World Industries, Celotex, USG, or approved equal.
- B. Mineral Base Panels, Nodular, Cast or Molded Type:
 - 1. Size: 12 by 12 inches by 3/4 inch.
 - 2. Size: 12 by 24 inches by 3/4 inch.
 - 3. Edge Detail: Square, kerfed and rabbeted joints.
 - 4. Edge Detail: Beveled, kerfed and rabbeted joints.
 - 5. Pattern: Fissured pattern.
 - 6. Type, Form, and Finish: ASTM E 1264, Type III, Form 1 with painted finish.
 - 7. Type, Form, and Finish: ASTM E 1264, Type IX, Form 1 with scrubbable finish.
- C. Mineral Base Panels, Water Felted:
 - 1. Size: 12 by 12 inches by 5/8 inch.
 - 2. Size: 12 by 12 inches by 3/4 inch.
 - 3. Edge Detail: Square, kerfed and rabbeted joints.
 - 4. Edge Detail: Beveled, kerfed and rabbeted joints.
 - 5. Pattern: Perforated and fissured pattern.
 - 6. Type, Form, and Finish: ASTM E 1264, Type III, Form 2 with painted finish.

- D. Concealed Suspension Systems, Non-Fire-Resistance Rated:
 - 1. Type: Direct-hung double-web intermediate-duty system, ASTM C 635.
 - 2. Type: Indirect-hung, ASTM C 635:
 - a. Intermediate duty system.
 - b. Heavy-duty system.
 - 3. Type: Indirect-hung snap-in heavy-duty system, ASTM C 635.
 - 4. Suspension System Accessories: Attachment devices and hangers, ASTM C 635.
- E. Concealed Suspension Systems, Fire-Resistance Rated:
 - 1. Type: Direct-hung double web intermediate-duty system, ASTM C 635.
 - 2. Type: Indirect-hung snap-in suspension heavy-duty system, ASTM C 635.
 - 3. Suspension System Accessories: Attachment devices and hangers, ASTM C 635.
- F. Auxiliary Materials:
 - 1. Tile adhesive.
 - 2. Tile staples.
 - 3. Integral access panels.
 - 4. Edge molding and trim.
 - 5. Hold-down clips and impact clips.
 - 6. Concealed acoustical sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and suspension systems in accordance with manufacturer's instructions and recommendations, and ASTM C 636. Coordinate installation with location of mechanical and electrical work to ensure proper locations.
- B. Level ceiling to within 1/8" in 10' in both directions. Scribe and cut panels to fit accurately. Measure and layout to avoid less than half panel units.
- C. Removal and reinstallation at existing ceilings: Remove and store materials for reuse. Handle with white gloves and avoid damaging corners and edges. Clean tiles and grid system, which have been removed. Provide additional materials to complete the work and to replace damaged existing materials. New materials shall match existing materials as approved.
- D. Adjust, clean, and touch-up all system components.

END OF SECTION

SECTION 09910

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide the following:
 - 1. Painting and surface preparation for interior unfinished surfaces as scheduled.
 - 2. Painting and surface preparation for exterior unfinished surfaces as scheduled.
 - 3. Field-painting and surface preparation of exposed mechanical and electrical piping, conduit, ductwork, and equipment.
 - 4. Repainting and surface preparation at areas of remodeling.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
 - 1. Include manufacturer's full range of color and finish options if additional selection is required.
- C. Extra Stock: Submit 2 unopened gallons of each paint and color used in the project.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Regulations: Compliance with VOC and environmental regulations.
- C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
 - 1. Provide 4 foot x 4 foot mock-ups of each type of surface.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers of Regular Paints: ICI Devoe Coatings, Benjamin Moore, Sherwin Williams or approved equal.
- B. Manufacturers of Multicolor Coatings: Polomyx, Zolatone or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
- B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.
- C. At existing areas to be repainted, remove blistered or peeling paint to sound substrates. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including caulk and glazing compounds. Spot prime bare areas before priming and painting as specified.
- D. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

3.2 PAINT SCHEDULE

- A. Gypsum Drywall Walls:
 - 1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
 - 2. System:
 - a. 1 coat latex primer
 - b. 1 coat latex finish
 - c. 2 coats latex finish
 - d. 1 coat alkyd finish
 - e. 2 coats alkyd finish
- B. Gypsum Drywall Walls and Ceilings in Bathrooms, Kitchens and Wet Areas:
 - 1. Gloss:
 - a. Semi
 - b. High
 - 2. Texture:
 - a. Stipple
 - 3. System:
 - a. 1 coat latex primer
 - b. 1 coat latex finish
 - c. 2 coats latex finish
 - d. 1 coat alkyd finish
 - e. 2 coats alkyd finish
- C. Gypsum Drywall Walls, Multicolor Finish:
 - 1. System:
 - a. 1 coat latex primer
 - b. 1 coat spray applied multicolor finish
- D. Gypsum Drywall Walls to Receive Wall Covering:
 - 1. System:
 - a. 1 coat latex primer

E. Gypsum Drywall Ceilings:

1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
2. System:
 - a. 1 coat latex primer
 - b. 1 coat latex finish
 - c. 2 coats latex finish
 - d. 1 coat alkyd finish
 - e. 2 coats alkyd finish

F. Plaster:

1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
2. System:
 - a. 1 coat latex primer
 - b. 1 coat latex finish
 - c. 2 coats latex finish
 - d. 1 coat alkyd finish
 - e. 2 coats alkyd finish

G. Wood for Painted Finish:

1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
2. System:
 - a. 1 coat interior alkyd enamel undercoat
 - b. 1 coat latex enamel
 - c. 2 coats latex enamel
 - d. 1 coat alkyd enamel
 - e. 2 coats alkyd enamel

H. Wood for Transparent Finish:

1. Gloss:
 - a. Satin
 - b. High
2. System:
 - a. 1 coat water base sealer
 - b. 1 coat oil base sealer
 - c. 2 coats water base varnish
 - d. 2 coats oil base varnish

I. Wood for Stain Finish:

1. Gloss:
 - a. Satin
 - b. High
2. System:
 - a. 1 coat water base wood stain
 - b. 1 coat oil base wood stain
 - c. 1 coat water base sealer
 - d. 1 coat oil base sealer

- e. 2 coats water base varnish
 - f. 2 coats oil base varnish
- J. Exterior Wood for Stain Finish:
 - 1. System:
 - a. 1 coat semi-transparent stain, oil or alkyd resin base
 - b. 2 coats semi-transparent stain, oil or alkyd resin base
 - c. 1 coat solid color stain, oil or alkyd resin base
 - d. 2 coats solid color stain, oil or alkyd resin base
- K. Exterior Wood for Painted Finish:
 - 1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
 - 2. System:
 - a. 1 coat exterior primer
 - b. 1 coat latex enamel
 - c. 2 coats latex enamel
 - d. 1 coat alkyd enamel
 - e. 2 coats alkyd enamel
- L. Concrete Masonry Units:
 - 1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
 - 2. System:
 - a. 1 coat latex block filler
 - b. 1 coat latex finish
 - c. 2 coats latex finish
- M. Concrete Walls:
 - 1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
 - 2. System:
 - a. 1 coat latex primer
 - b. 1 coat latex finish
 - c. 2 coats latex finish
- N. Ferrous Metals:
 - 1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
 - 2. System:
 - a. 1 coat rust-inhibiting primer
 - b. 1 coat latex enamel
 - c. 2 coats latex enamel
 - d. 1 coat alkyd enamel
 - e. 2 coats alkyd enamel

O. Galvanized Metal:

1. Gloss:
 - a. Flat
 - b. Semi
 - c. High
2. System:
 - a. 1 coat galvanized metal primer
 - b. 1 coat alkyd enamel
 - c. 2 coats alkyd enamel

END OF SECTION

SECTION 09931
EXTERIOR STAINS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide exterior stain and surface preparation.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Regulations: Compliance with VOC and environmental regulations.
- C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Cabot, Glidden Co., Benjamin Moore, Sherwin Williams or approved equal. First-line commercial-quality products for all stain systems.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
- B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.
- C. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

3.2 EXTERIOR STAIN SCHEDULE

- A. Exterior Wood Siding, Shingles, and Shakes:

1. Semi-transparent, oil or alkyd resin base stain, 2 coats.
2. Semi-solid color, oil or alkyd resin base wood stain, 2 coats.
3. Solid color, oil or alkyd resin base stain, 1 or 2 coats.
4. Solid color, latex emulsion base stain, 1 or 2 coats.
5. Linseed-oil based pigmented bleaching agent, 2 coats.
6. Oil based pigmented bleaching agent, 2 coats.
7. Clear wood finish and preservative, 2 coats.

B. Wood Trim:

1. Semi-transparent, oil or alkyd resin base stain, 2 coats.
2. Semi-solid color, oil or alkyd resin base wood stain, 2 coats.
3. Solid color, oil or alkyd resin base stain, 1 or 2 coats.
4. Solid color, latex emulsion base stain, 1 or 2 coats.
5. Oil or alkyd resin based pigmented bleaching agent, 2 coats.
6. Oil based pigmented bleaching agent, 2 coats.
7. Clear wood finish and preservative, 2 coats.

C. Wood Soffits and Fascia:

1. Semi-transparent, oil or alkyd resin base stain, 2 coats.
2. Semi-solid color, oil or alkyd resin base wood stain, 1 or 2 coats.
3. Solid color, oil or alkyd resin base stain, 1 or 2 coats.
4. Solid color, latex emulsion base stain, 2 coats.
5. Oil or alkyd resin based pigmented bleaching agent, 2 coats.
6. Oil based pigmented bleaching agent, 2 coats.
7. Clear wood finish and preservative, 2 coats.

D. Wood Roofs:

1. Semi-transparent, oil or alkyd resin base stain, 2 coats.
2. Semi-solid color, oil or alkyd resin base wood stain, 2 coats.
3. Oil or alkyd resin based pigmented bleaching agent, 2 coats.
4. Oil based pigmented bleaching agent, 2 coats.
5. Clear wood finish and preservative, 2 coats.

E. Wood Decks and Fences:

1. Wood deck and fence stain, 2 coats.
2. Semi-transparent, oil or alkyd resin based stain, 2 coats.

END OF SECTION

SECTION 10210
LOUVERS AND VENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wall louvers and vents.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Airline Products, Airolite, Construction Specialties, Industrial Louvers or approved equal.
- B. Aluminum Louvers:
 - 1. Aluminum Extrusions: ASTM B 221, alloy 6063-T5 or T51, 0.81" minimum thickness.
 - 2. Blades: Horizontal storm-resistant louvers.
 - 3. Blades: Vertical storm-resistant louvers.
 - 4. Blades: Horizontal drainable blades.
 - 5. Blades: Horizontal continuous-line drainable blades.
 - 6. Blades: Horizontal sightproof drainable blades.
 - 7. Blades: Horizontal non-drainable.
 - 8. Blades: Vertical sightproof.
 - 9. Blades: Blades with integral acoustic insulation.
 - 10. Blade Type: Fixed.
 - 11. Blade Type: Operable.
 - 12. Finish: Clear anodized.
 - 13. Finish: Color anodized.
 - 14. Finish: Baked enamel.
 - 15. Finish: High-Performance Organic Finish, 2-Coat 70% Fluoropolymer.
 - 16. Finish: High-Performance Organic Finish, 3-Coat 70% Fluoropolymer.

C. Steel Louvers:

1. Galvanized Steel: ASTM A 653 or ASTM A 653, G90 zinc coating.
2. Blade: Horizontal drainable fixed blades.
3. Blade: Horizontal non-drainable.
4. Finish: Baked enamel.
5. Finish: Fluoropolymer, Kynar 500.

D. Louver Accessories:

1. Bird screens.
2. Insect screens.
3. Blank-off panels.
4. Insulated blank-off panels.
5. Glazing for louvered vent assemblies.

E. Wall Vents:

1. Material: Extruded aluminum.
2. Material: Cast aluminum.
3. Blade Type: Fixed.
4. Blade Type: Adjustable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Comply with AMCA Standard 500 and provide units with AMCA Certification rating seal. Comply with SMACNA Sheet Metal Manual except as otherwise indicated.
- C. Provide separate continuous sills where needed to prevent water penetration. Maintain equal blade-to-blade and blade-to-frame spacing for uniform appearance. Provide concealed vertical mullions and reinforcement as needed.
- D. Provide anchors, supports and accessories as needed. Provide gaskets, flashings and fillers as necessary to make installation watertight.
- E. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10440
INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide interior signage.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Andco Industries Corp., ASI Sign Systems, The Supersine Co., Vomar Products, or approved equal.
- B. Panel Signs:
 - 1. Type: Framed.
 - 2. Type: Unframed.
 - 3. Material: Aluminum.
 - 4. Material: Plastic.
 - 5. Material: Stainless steel.
 - 6. Material: Wood.
 - 7. Copy: Engraved lettering.
 - 8. Copy: Raised lettering.
 - 9. Copy: Applied die-cut vinyl lettering.
- C. Dimensional Letters and Numbers:
 - 1. Type: Cut-out of solid stock.
 - 2. Type: Fabricated.
 - 3. Type: Cast.
 - 4. Material: Aluminum, anodized finish.
 - 5. Material: Bronze, satin finish.
 - 6. Material: Stainless steel, satin finish.
 - 7. Material: Wood.
- D. Cast Plaques:

1. Material: Aluminum castings.
2. Material: Bronze castings, statuary finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10523
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide fire extinguishers.
- B. Provide fire extinguishers and cabinets.
- C. Provide cabinets for extinguisher and hose valve or hose, rack, and valves.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: UL and FM listed products, NFPA 10.
- C. Regulations: ADAAG.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufactures: J. L. Industries, Larsen's Manufacturing, Potter-Roemer, or approved equal.
- B. Fire Extinguishers:
 - 1. Type: Multipurpose dry chemical type.
 - 2. Type: Stored-pressure water type.
 - 3. Rating: Sized for project requirements.
 - 4. Public Area Mounting: Cabinet mounted.
 - 5. Service Area Mounting: Metal brackets.
- C. Cabinets:
 - 1. Mounting: Recessed.
 - 2. Mounting: Semi-recessed.
 - 3. Mounting: Surface-mounted.
 - 4. Trim: Trimless.
 - 5. Trim: Trimless with hidden flange.
 - 6. Trim: Exposed.

7. Doors: Enameled steel, baked enamel finish.
8. Doors: Steel, factory primed.
9. Doors: Aluminum, clear anodized finish.
10. Doors: Aluminum, color anodized finish.
11. Doors: Aluminum, baked enamel finish.
12. Doors: Aluminum, factory primed.
13. Doors: Stainless steel bright, directional polish, No. 4.
14. Doors: Stainless steel mirror like reflective, nondirectional polish, No. 8.
15. Doors: Copper-alloy brass buffed finish.
16. Doors: Copper-alloy brass medium satin finish.
17. Doors: Copper-alloy brass statuary conversion finish.
18. Doors: Copper-Alloy Bronze buffed finish.
19. Doors: Copper-alloy bronze medium satin finish.
20. Doors: Copper-alloy bronze statuary conversion finish.
21. Doors: Acrylic.
22. Doors: Plastic laminate.
23. Door Style: Full-glass panel.
24. Door Style: Duo-panel.
25. Door Style: Solid panel.
26. Door Style: Acrylic bubble.
27. Accessories:
 - a. Glass breaker or fire handle.
 - b. Signage.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Install fire extinguishers in mechanical and service areas with wall-hung brackets at locations and heights indicated and acceptable to authorities having jurisdiction.
- C. Install fire extinguishers in cabinets in public areas plumb and level at heights acceptable to authorities having jurisdiction.
- D. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10810
TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide toilet accessories and metal-framed mirrors.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: American Specialties Inc., Bobrick Washroom Equipment, Bradley Corp., or approved equal.
- B. Toilet Accessories:
 - 1. Paper towel dispensers.
 - 2. Toilet tissue dispensers, single roll.
 - 3. Toilet tissue dispensers, double roll.
 - 4. Waste receptacles.
 - 5. Combination towel dispenser/waste receptacle units.
 - 6. Multipurpose units.
 - 7. Grab bars.
 - 8. Sanitary napkin vendors.
 - 9. Sanitary napkin disposal units.
 - 10. Soap dispensers, wall mounted.
 - 11. Soap dispensers, deck mounted.
 - 12. Seat cover dispensers.
 - 13. Shower curtain rods.
 - 14. Shower curtains and hooks.
 - 15. Soap dishes, recessed.
 - 16. Soap dishes, surface mounted.
 - 17. Towel bars.
 - 18. Towel pins.
 - 19. Towel rings.
 - 20. Folding shower seats.
 - 21. Medicine cabinets.

22. Facial tissue dispensers.
23. Mop and broom holders.
24. Robe hooks.
25. Tumblers and toothbrush holders.
26. Condom vendors.
27. Purse shelf.
28. Retractable clothes lines.
29. Bottle openers.
30. Ash urns.
31. Baby changing stations.
32. Electric hand dryers.

C. Mirrors and Frames:

1. Glazing: Mirror glass, 1/4 inch thick, ASTM C 1036.
2. Frames: Stainless steel.
3. Frames: Stainless steel with shelf.
4. Frames: Aluminum.
5. Frames: Aluminum with shelf.
6. Type: Standard wall unit.
7. Type: Fixed tilt type.
8. Type: Adjustable tilt type.
9. Type: Stainless steel security type.

D. Finishes:

1. Stainless Steel; AISI Type 302 or 304, No. 4 polished finish.
2. Chromium Plated Brass or Steel; ASTM B 456, Type SC 2.
3. Phenolic Faces; high-pressure melamine.
4. Baked Enamel on Steel; factory-applied gloss white.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 11460

UNIT KITCHENS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide prefabricated kitchen units.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturers: Acme Kitchen Products, Cervitor Kitchens, Davis Products, Dwyer Products or approved equal.

- A. Unit Kitchen Materials:

1. Counter: Stainless steel.
2. Counter: Plastic laminate.
3. Cabinets Above Counter: Steel, baked enamel finish.
4. Cabinets Above Counter: Hardwood veneer.
5. Cabinets Below Counter: Steel, baked enamel finish.
6. Cabinets Below Counter: Hardwood veneer.
7. Ends: Finished.
8. Ends: Unfinished for recessed installation.

- B. Appliances:

1. Sink with swing spout faucet and handles.
2. Food waste disposer.
3. Hot water dispenser.
4. Dishwasher.
5. Undercounter refrigerator.
6. Electric range.
7. Electric oven.
8. Microwave oven.
9. Range hood.
10. Undercabinet light fixture.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 11690
SPECIALTY EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide specialty equipment.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Specialty Equipment:
 - 1. Maintenance equipment.
 - 2. Window washing equipment.
 - 3. Security and vault equipment.
 - 4. Teller and service equipment.
 - 5. Ecclesiastical equipment.
 - 6. Registration equipment.
 - 7. Checkroom equipment.
 - 8. Mercantile equipment.
 - 9. Commercial laundry equipment.
 - 10. Vending equipment.
 - 11. Vehicle service equipment.
 - 12. Detention equipment.
 - 13. Water supply and treatment equipment.
 - 14. Darkroom equipment.
 - 15. Athletic equipment.
 - 16. Recreational equipment.
 - 17. Therapeutic equipment.
 - 18. Industrial and process equipment.
 - 19. Laboratory equipment.
 - 20. Planetarium equipment.
 - 21. Office equipment.

- 22. Medical equipment.
- 23. Mortuary equipment.
- 24. Navigation equipment.
- 25. Agricultural equipment.
- 26. Hoist and crane equipment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 13850

DETECTION AND ALARM

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide fire detection and alarm systems:
 - 1. Zoned, noncoded fire detection and alarm system with manual and automatic alarm initiation.
 - 2. Zoned, noncoded, addressable, microprocessor-based fire detection alarm system with manual and automatic alarm initiation.
 - 3. Zoned, noncoded, addressable, microprocessor-based fire detection and alarm system with manual and automatic alarm initiation, analog addressable smoke detectors, and automatic alarm verification for alarms initiated by designated smoke detector zones.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.
- C. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
- D. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 70, 71, 72, 72E, 72G, 72H.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fire Alarm System Operational Characteristics:
 - 1. Signal Transmission: Hard-wired individual circuits.
 - 2. Signal Transmission: Dedicated multiplex signal transmission.
 - 3. Audible Alarm Indication: Horns and bells
 - 4. Audible Alarm Indication: Horns, bells, and tone signals on loudspeakers.
 - 5. Audible Alarm Indication: Horns, bells, tone signals on loudspeakers, and voice alarm messages.

6. Interface: Smoke removal systems, smoke dampers, air handling units control.
- B. Fire Alarm System Components:
 1. Manual Pull Stations: Double-action type, metal or plastic.
 2. Smoke Detectors: UL 268, self-restoring type with visual indicator, photoelectric and ionization-types.
 3. Thermal Detectors: Fixed-temperature and rate-of-rise type.
 4. Flame Detectors: Ultraviolet type with delay.
 5. Fire Alarm Bells: Electric vibrating under-dome type.
 6. Fire Alarm Horns: Electric vibrating polarized type.
 7. Visual Alarm Devices: Dual-voltage strobe lights.
 8. Voice/Tone Speakers: UL 1480 type.
 9. Fire Fighters Telephones: Telephone handset with dedicated, supervised communication lines.
 10. Device Location-Indicating Lights: System-voltage-indicating light.
 11. Magnetic Door Holders: Wall or floor mounted type.
 12. Fire Alarm Control Panel: UL 864 with lockable steel enclosure and alphanumeric display and system controls.
 13. Graphic Annunciator: LED indicators on graphic building floor plan.
 14. System Printer: Dot-matrix type.
 15. Transmitter: Auto-dialer type.
 16. Emergency Power Supply: Battery operated, 24-hour operation capacity.
 17. Line-Voltage and Low-Voltage Circuits: Solid copper conductors with rated insulation, color-coded.
 18. Conduit: Rigid steel, hardened, fire-rated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Provide proper clearances for servicing.
- B. Comply with National Electrical Code and building code requirements. Maintain continuity of circuits required to supply new or existing equipment in service.
- C. Provide core drilling as required for new work.
- D. Conceal conduit to the greatest extent practical.
- E. Center ceiling-mounted elements in center of ceiling tiles as applicable.
- F. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- G. Test all systems for proper operation. Label circuits in electrical panels.
- H. Restore damaged finishes. Clean and protect work from damage.
- I. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 13900

FIRE PROTECTION

NOTE: Use this Section for Fire Protection when you want to specify all work of this type in a single section.

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide fire protection systems including:
 - 1. Sprinkler.
 - 2. Standpipe.
 - 3. Fire detection system.
 - 4. Fire alarm system.
 - 5. Modify and extend existing service to accommodate new work. Relocate existing heads as required for new system.
- B. Maintain fire alarm system in operation during construction.
- C. Coordinate with Owner's room uses to provide adequate system for all contract areas.
- D. Coordinate location of fire protection systems to avoid interference with location of designated lighting fixture locations. Notify Owner prior to construction of conflicts, which cannot be resolved.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- A. Provide complete sprinkler coverage per NFPA 13.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide sprinkler systems components including standpipes, backflow preventers, hose cabinets, fire pump, jockey pump, starter, fire department connection, test valves, horns, signals, and all required accessories.
- B. Zoned Electrically-Supervised Fire Detection And Fire Alarm System: Components include equipment, photoelectric and thermal detectors, duct smoke detectors, and control equipment. Comply with NFPA 72B. Provide system by Simplex, Kidde, or approved equal.
- C. Pipe And Fittings: Schedule 40 steel with threaded ends meeting NFPA requirements.
- D. Valves: Bronze construction; 2" and small with bronze bodies and bonnets with screwed ends; 2-1/2" and larger flanged. Fire valves by Grinnell, Elkhart, or approved equal.
- E. Sprinkler Heads: Style as approved by Grinnell, Star, Firematic, or approved equal.
- F. Fire Department Connection: Free-standing polished brass by Viking, Grinnell, or approved equal. Provide threads, which comply with local fire department regulations.
- G. Fire Pump: Size and configuration per NFPA requirements. Horizontal split case, single stage, double suction pump by Aurora, Fairbanks, Patterson, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Center ceiling-mounted elements in center of ceiling tiles as applicable.
- C. Clearly label all valves and components.
- D. Restore damaged finishes. Test all systems for proper operation in accordance with NFPA 13, 14, and 20. Clean and protect work from damage.
- E. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 13930
FIRE SUPPRESSION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide sprinkler system:
 - 1. Wet pipe system with automatic sprinklers.
 - 2. Dry pipe system with automatic sprinklers.
 - 3. Preaction system with automatic sprinklers.
 - 4. Deluge system with open sprinklers.
 - 5. Combined dry pipe and preaction system with automatic sprinklers.
- B. Provide standpipe and hose system:
 - 1. Wet type with water supply valve open and pressure maintained.
 - 2. Dry, without permanent water supply, with piping full of water.
 - 3. Dry, with device to open and admit water.
 - 4. Dry, with manually operated control devices.
 - 5. NFPA 14 Class I classification for use by trained personnel.
 - 6. NFPA 14 Class II classification for use by building occupants and trained personnel during initial response.
 - 7. NFPA 14 Class III classification for building occupants and trained personnel.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.
 - 2. Provide hydraulic calculations for pipe sizing.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Local Fire Department Requirements: Comply with requirements of the local Fire Department pertaining to sprinkler systems and standpipes. Obtain approval from local Fire Marshall, in writing, of proposed fire-protection system before proceeding with installation.
- C. Compliance: NFPA 13 for sprinkler system, NFPA 14 for standpipes; UL listed and labeled; FM approved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipes and Fittings:

1. Ductile Iron Pipe: AWWA C115, ductile-iron barrel with iron-alloy threaded flanges.
2. Steel Pipe: ASTM A 53, Schedule 40 in sizes 6 inches (150 mm)(DN150) and smaller, Schedule 30 in sizes 8 inches (200 mm) (DN200) and larger, black and galvanized.
3. Steel Pipe: ASTM A 135, Schedule 10 through 5 inch (125 mm) (DN125) and NFPA 13 wall thickness for 6 inch (150 mm) (DN150) through 10 inch (250 mm) (DN250), plain ends, black and galvanized.
4. Steel Pipe: ASTM A 135, threadable lightwall, black and galvanized.
5. Steel Pipe: ASTM A 795, black and galvanized for plain end steel pipe.
6. Copper Tube: ASTM B 88, Types L and M.
7. Chlorinated Polyvinyl Chloride (CPVC) Pipe: ASTM F 442, UL listed.
8. Polybutylene (PB) Plastic Pipe, ASTM D 3309, UL listed.
9. Fittings: Suitable for service class and piping type; threaded, grooved-end, press-seal types.
10. Joining Materials: Welding and gasket materials suitable for design temperatures and pressures. Victaulic materials and couplings.

B. Valves and Accessories:

1. General Duty Valves: Gate valves, swing check valves.
2. Specialty Valves: Alarm check valves, dry-pipe valves, deluge valves, detector check valves suitable for system use.
3. Manual Control Stations: Hydraulic operation, with union, pipe nipple and bronze ball valve.
4. Control Panels: Single area, two area, or single area cross-zoned as required, NEMA ICS 6 Type 1 enclosure.
5. Water Meters: AWWA C700 series as applicable.
6. Backflow Preventers: ASSE, sized for maximum flow rate and maximum pressure loss.
7. Excess Pressure Pumps: UL listed, positive-displacement, gear-type pump assembly.
8. Fire Department Connections: UL 405 unit, connections and finish suitable for use:
9. Flush, wall type.
10. Exposed, wall type.
11. Exposed, sidewalk type.
12. Alarm Devices: Water-motor-operated alarms, waterflow indicators, pressure switches, supervisory switches.
13. Pressure Gages: UL 393.

C. Sprinklers, Hose Racks and Accessories:

1. Automatic Sprinklers: Fusible link type; upright, pendant, and sidewall styles; concealed, flush, and recessed styles; wall-mounted sprinkler head cabinet and wrench, suitable for service required.
2. Sprinkler Fittings: UL listed and FM approved, UL 213.
3. Nonadjustable Hose Valves: UL 668.
4. Pressure Regulating Hose Valves: UL 1468.
5. Hose Racks and Hoses: UL 47, semiautomatic hose rack assembly; UL 668 rating.
6. Fire Hose: Lined, length and nozzle suitable for application.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Vent all fixtures. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Conceal piping and ductwork to the greatest extent practical.
- D. Center ceiling mounted elements in center of ceiling tiles as applicable.
- E. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- F. Clearly label and tag all components.
- G. Test and balance all systems for proper operation.
- H. Restore damaged finishes. Clean and protect work from damage.
- I. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15050
BASIC MECHANICAL MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work of this section includes providing basic mechanical materials including, but not limited to, the following:
 - 1. Valves.
 - 2. Pipe expansion joints.
 - 3. Meters and gages.
 - 4. Supports and anchors.
 - 5. Motors.
 - 6. Mechanical identification.
 - 7. Vibration control.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Pipe, Fittings, and Specialties: Refer to individual piping systems specifications for materials and installation requirements.
- B. Valves: General duty valves cast iron, bronze, and brass, fabricated to comply with Manufacturers Standardization Society (MSS) classification listed. Gate, globe, ball, butterfly, and plug valves for shutoff duty; globe, ball, and plug valves for throttling duty.
 - 1. Gate Valves, 2-Inch and Smaller for Condenser Water, Chilled Water, Domestic Hot and Cold Water: MSS SP-80, Class 125 or 150 based on system pressure, cast bronze, threaded or solder ends based on service.
 - 2. Gate Valves, 2-Inch and Smaller for Heating Hot Water and Low-Pressure Steam: MSS SP-80, Class 150, cast bronze, threaded or solder ends based on service.
 - 3. Gate Valves, 2-1/2-Inch and Larger: MSS SP-70, Class 125, iron body, flanged ends.

4. Ball Valves, 1 Inch and Smaller: Rated for 150 psi saturated steam pressure, 400 psi WOG pressure, 2 piece construction, bronze body, threaded or solder ends based on service.
 5. Ball Valves, 1-1/4-Inch to 2-Inch: Rated for 150 psi saturated steam pressure, 400 psi WOG pressure, 3 piece construction, bronze body, threaded or solder ends based on service.
 6. Plug Valves, 2-Inch and Smaller: Rated at 150 psi WOG, bronze body, threaded ends.
 7. Plug Valves, 2-1/2-Inch and Larger: MSS SP-78, rated at 175 psi WOG, semi-steel body, flanged ends.
 8. Globe Valves, 2-Inch and Smaller: MSS SP-80, Class 125 or 150 based on system pressure, cast bronze, threaded or solder ends based on service.
 9. Globe Valves, 2-1/2-Inch and Larger: MSS SP-85, Class 125, iron body, flanged ends.
 10. Butterfly Valves: 2-1/2-Inch and Larger: MSS SP-67, rated at 200 psi, cast iron body, field replaceable sleeve, stainless steel stem, lug or wafer type based on service.
 11. Swing Check Valves, 2-Inch and Smaller: MSS SP-80, Class 125 or 150 based on system pressure, cast-iron body and cap, threaded or solder ends based on service.
 12. Swing Check Valves, 2-1/2 Inch and Larger: MSS SP-71, Class 125 or Class 175 FM for fire protection piping systems), cast iron body and cap, flanged ends.
 13. Wafer Check Valves: Class 250, cast-iron body, to open with one-foot differential pressure.
 14. Lift Check Valves, 2-Inch and Smaller: Class 125, cast-bronze body and cap, threaded ends.
- C. Expansion Joints for Piping Systems: Joints shall provide 200 percent absorption capacity of piping expansion between anchors.
1. Packless expansion joints.
 2. Slip joints.
 3. Flexible ball pipe joints.
 4. Mechanical grooved fittings.
 5. Fabricated expansion loops.
- D. Meters and Gages: Temperature and indicator ranges for services required. Accuracy of thermometers plus or minus 1 percent.
1. Mercury-In-Glass Thermometers: Die-cast, aluminum finished, glass front, mercury filled tube with magnifying lens.
 2. Direct-Mount Filled-System Dial Thermometers: Vapor actuated, universal angle, drawn steel or cast aluminum case with glass lens.
 3. Remote-Reading Filled-System Dial Thermometers: Vapor actuated, drawn steel or cast aluminum case with glass lens.
 4. Bimetal Dial Thermometers: Direct mounted, bimetal, universal angle type with stainless steel case, glass lens.
 5. Dial-Type Insertion Thermometers: Bimetal, stainless steel case and stem.
 6. Thermometer Wells: Brass or stainless steel, pressure rated to match piping system design pressure.
 7. Pressure Gages: General use, ASME B40.1, Grade A, phosphor bronze bourdon-tube type, drawn steel or brass case, glass lens.
 8. Pressure Gauge Accessories: Brass tubing straight coil syphon; brass snubber with disc suitable for fluid served and rated pressure.
 9. Wafer Orifice-Type Flood Elements: Differential-pressure type, cast-iron body, brass valves with integral check valves and caps.
 10. Venturi-Type Flow Elements: Differential-pressure type, for installation in piping, bronze or cadmium-plated steel with brass fittings.
 11. Pitot Tube-Type Flow Elements: Differential-pressure pitot tube-type design with probed, stainless steel probe.

- 12. Window-Type Flow Meters: Designed for installation on hydronic piping, measure flow directly in gpm, bronze body and impact tube, integral self-closing valve with indicator valve, plus or minus 5 percent accuracy.
- 13. BTU Meters: Turbine wheel flow meter, temperature sensors, calculator with integral battery back, bronze housing, plus or minus 1 percent accuracy.
- 14. Test Plugs: Nickel-plated brass body, self-sealing valve-type core inserts.
- E. Supports and Anchors: Hangers and Support Components: MSS SP-58, pipe and equipment hangers and supports including clamps, hanger-rod attachments, saddles and shields, spring hangers, pipe alignment guides, and anchors.
- F. Motors: NEMA MG 1 motors with phase, frequency rating, voltage rating, and capacity suitable for use.
- G. Mechanical Identification: ASME A13.1 as applicable, color coded, of the following types: Standard stencils, snap-on plastic pipe markers, pressure-sensitive pipe markers, plastic duct markers, plastic tape, valve tags, valve tag fasteners, access panel markers, valve schedule frames, engraved plastic laminate signs, plastic equipment markers, plasticized tags suitable for use.
- H. Vibration Control: Fiberglass pads and shapes, neoprene pads, vibration isolation springs, pad-type isolators, plate-type isolators, double-plate-type isolators, threaded double-plate-type isolators, all-directional anchors, neoprene mountings, free standing spring isolators, housed spring isolators, vertically-restrained spring isolators, earthquake-resistant spring isolators, seismic snubbers, thrust restraints, equipment rails, fabricated equipment bases, inertia base frames, roof-curb isolators, isolation hangers, riser isolators, flexible pipe connectors suitable for use.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15400

PLUMBING

NOTE: Use this Section for Plumbing when you want to specify all work of this type in a single section.

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide plumbing systems including supply, waste and vent systems for:
 - 1. Toilet rooms.
 - 2. Kitchens.
 - 3. Food service equipment.
 - 4. Water heaters.
 - 5. Floor drains.
 - 6. Service sinks.
 - 7. Sewage ejectors.
 - 8. Storm drainage.
 - 9. Pool systems.
 - 10. Access panels.
 - 11. Modify and extend existing service to accommodate new work. Remove existing systems and piping no longer required.
- B. Coordinate with Owner's room uses to provide adequate system for all contract areas.
- C. Coordinate location of plumbing systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts, which cannot be resolved.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide plumbing systems components and all required accessories including shut-offs and clean-outs. Provide components, which prevent back-siphonage or cross-connections.
- B. Sanitary, waste and vent piping: Service weight cast iron with load and oakum fittings or no-hub pipe with MG joints or clamp-all couplings for pipe 2-1/2" and larger. Service weight cast iron or Type DWV copper pipe and copper fittings for 2" and smaller waste pipe, except provide cast iron pipe on urinal waste.
- C. Hot And Cold Water Piping: Type L seamless hard drawn copper tubing assembled with solder fittings. Support piping with grade to drain to drainoff cocks.
- D. Hangers: For cast iron, provide heavy wrought iron pipe hangers, brackets or clamps at 5' intervals. Fasten with lag screw or with expansion shields as applicable. For water piping, provide adjustable wrought iron copper plated hangers at 6' intervals maximum. Provide hangers to allow for full thickness of insulation.
- E. Sleeves And Escutcheons: Galvanized wrought iron. Where uncovered pipes pass through finished areas, provide heavy chromium escutcheons.
- F. Covering And Insulation: For domestic hot and cold water piping 1/2" flexible foamed tubing by Owens Corning or Armstrong Armaflex, or approved equal. Seal joints vapor tight. Insulate valves and fittings including water service piping with equal thickness of pipe insulation. Provide 18 gauge protection saddles between insulation and pipe hangers. Comply with fire hazard regulations.
- G. Valves And Shut-Offs: Full size bronze gate valves for hot and cold water branches. Provide drainage valves. Provide units by Hammond, Jenkins, Nibco or approved equal.
- H. Hose Bibbs: Anti-siphon hose bibbs by Woodford or approved equal.
- I. Floor Drains And Cleanouts: Units with bronze strainer and copper flashing by Zurn or approved equal.
- J. Shock Absorbers: Units by Zurn or approved equal.
- K. Domestic Water Mixing Valve: Self-contained thermostatic type including hot water temperature limit, check valves, stainers and stop valves by Leonard, Symmons, Johnson or approved equal.
- L. Water Heater: Glass lined storage type for utility service at site. Provide baked enamel steel jacket, fiberglass insulation, and UL flame retention burner; 10 year warranty.
- M. Water Cooler: Stainless steel dual drinking fountain by Haws, Oasis or approved equal.
- N. Sewage Ejector: Size and automatic controls to meet project requirements by Weil or approved equal.
- O. Pool Systems: Complete system including filters, recirculating pumps, chlorination equipment, water heaters, and deck drain.
- P. Access Panels: Metal units with locks by Karp, Milcor, Nystrom or approved equal. Configuration and trim as required by finish wall surface.

2.2 FIXTURE SCHEDULE

- A. Water Closets And Accessories: White vitreous china syphon jet elongated water closet to operate on 3 gallons of water or less, and as required by code by Kohler, Eljer, American Standard, or approved equal.
 - 1. Water closet fixture supports by Smith Manufacturing, or approved equal.
 - 2. Water closet flushometers by Sloan Royal, or approved equal. Elongated white contoured toilet seats with encased stainless steel hinges.
- B. Urinals and accessories: White vitreous china washout action urinal with outlet, wall hanger, and removable beehive strainer by Kohler, Eljer, American Standard or approved equal. Urinal flushometers by Sloan Royal or approved equal. Steel urinal wall supports by Zurn, or approved equal.
- C. Lavatories and accessories: 18" diameter, white self-rimming acid-resisting enameled cast iron round lavatories with 4" faucet centers by Kohler, Eljer, American Standard or approved equal. Faucets with water guard feature, perforated strainer, tail piece.
- D. Service sinks and accessories: White acid-resisting enameled cast iron service sink with stainless steel rim guard and wall hanger by Kohler or approved equal. Trap standard with cleanout plug and strainer. Faucet with vacuum breaker, threaded spout and pail hook.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Install shutoff valves on each piece of equipment on both hot and cold water supply.
- D. Clearly label all valves and components.
- E. Sterilize water distribution system. Flush and test all systems for proper operation. Adjust system to prevent water hammer.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15410
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide plumbing fixtures and trim, fittings, and related accessories and appliances.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards:
 - 1. Materials, Products, and Installation: ASME B31.9.
 - 2. Plastic Piping Components: NSF 14.
- C. Compliance: ANSI A117.1 and local regulations.
- D. Accessibility Requirements: ADAAG and local requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plumbing Fixtures:
 - 1. Water Closets: Consumption per flush cycle, material, bowl type, mounting, outlet, rim height, tank type, trim suitable for service required.
 - 2. Urinals: Consumption per flush cycle, material, floor mounting and wall hanging types, outlet, trim suitable for service required.
 - 3. Lavatories: Material, mounting, fittings and accessories suitable for service required.
 - 4. Sinks: Material, type, wall and counter mounting type, fittings and accessories suitable for service required.
 - 5. Service Sinks: Material, trap standard or floor mounting, fittings suitable for service required.
 - 6. Mop Basins: Materials and fittings suitable for service required.
 - 7. Bathtubs: Materials and fittings, including shower suitable for service required.

8. Showers: Enclosure material, receptor material, shower door, fittings suitable for service required.
9. Whirlpools: Materials, fittings suitable for service required.
10. Drinking Fountains: Material, type, wall hung and pedestal mounting, fittings suitable for service required.
11. Water Coolers: ARI 100, type, capacity, and fittings suitable for service required.
12. Wash Fountains: Type, mounting, fittings suitable for service required.
13. Bidets: Material, floor and wall mounting, fittings suitable for service required.
14. Outlet Boxes: Material, hose bibb shutoff, recessed wall-mounting, fittings suitable for service required.
15. Emergency Equipment: Eyewash and shower stations.
16. Toilet Seats: Compatible with water closet.
17. Flushometers: Water closet and urinal types.
18. Bedpan Washers: Hand-control and foot-control types.
19. Commercial Faucets: Cast-brass faucets.
20. Commercial/Residential Faucets: Cast-brass and cast-brass underbody faucets.
21. Residential/Light Commercial Faucets: Nonmetal underbody faucets.
22. Bath/Shower Pressure Balance Faucets: Single-lever type.
23. Bath/Shower Thermostatic Mixing Valve Faucets: Single-lever type.
24. Shower Receptors: Terrazzo or molded stone type.
25. Sensor-Operated Faucets and Devices: Automatic operating units.
26. Fittings, Except Faucets: Supplies, stops, traps, continuous wastes, and escutcheons.
27. Supports: ASME A112.6.1M, categories and types as required for fixtures required, including wall reinforcement.
28. Hot Water Dispensers: ASSE 1023 instant on-off control.
29. Disposers: Continuous feed type food waste disposer, UL 430.
30. Water Filters: Replaceable cartridge type.

2.2 SCHEDULE

- A. [Insert specific information, if available.]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15440
PLUMBING PUMPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide the following:
 - 1. Centrifugal pumps for water distribution systems for recirculating or boosting pressure.
 - 2. Sump pumps for drainage water piping systems.
 - 3. Sewage pumps.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards:
 - 1. Materials, Products, and Installation: ASME B31.9.
 - 2. Plastic Piping Components: NSF 14.
- C. Compliance: UL 778.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plumbing Pumps:
 - 1. Compact Inline Circulator Pumps: Leakproof, inline, without seal, volute-type pump.
 - 2. Inline Booster Pumps: Horizontal inline, centrifugal, separately coupled, single-stage, all-bronze, radially split case type.
 - 3. Inline Circulators: Horizontal inline, centrifugal, separately coupled, single-stage, all-bronze, radially split case type.
 - 4. Vertical Inline Pumps: Centrifugal, close-coupled, single-stage, all-bronze, radially split case type.
 - 5. Base-Mounted, Close-Coupled, End-Suction Pumps: Centrifugal, single-stage, all-bronze, radially split case type.
 - 6. Base-Mounted, Separately Coupled, End-Suction Pumps: Centrifugal, single-stage, all-bronze, radially split case type.

B. Sump Pumps:

1. Sump Pumps: Simplex, vertical, suspended, centrifugal, separately coupled, end suction, single stage, bronze fitted with integral inlet strainer, controls and sump cover.
2. Submersible Sump Pumps: Simplex, vertical, centrifugal, direct connected, end suction, single stage, bronze fitted with integral inlet strainer, controls and sump cover.

C. Sewage Pumps:

1. Wet-Pit Mounted, Vertical Sewage Pumps: Centrifugal, separately coupled, suspended-type.
2. Submersible Sewage Pumps: Centrifugal, direct-connected type, with guide rails.
3. Submersible Cutter Sewage Pumps: Centrifugal, direct-connected type, with quick-disconnect system.
4. Submersible Grinder Sewage Pumps: Centrifugal, direct-connected type, with quick-disconnect system.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15460
PLUMBING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide the following
 1. Water storage tanks for use in plumbing water supply system.
 2. Commercial water softeners for use in building water supply system.
 3. Commercial water heaters for potable water heat systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards:
 1. Materials, Products, and Installation: ASME B31.9.
 2. Plastic Piping Components: NSF 14.
- C. Compliance, Storage Tanks: ASME Code; AWWA standards for nonpressure tanks; NFPA 22.
- D. Compliance, Water Softeners: ASME Code; NSF 44.
- E. Compliance, Water Heaters: UL 174, 732, 778, 1261, 1453; NSF 5; ASME Code Compliance.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Water Storage Tanks and Accessories:
 1. Water: Potable.
 2. Water: Non-potable.
 3. Pressure Rating: 125 psig (860 kPa).
 4. Pressure Rating: None.
 5. Plain Steel, Pressure Water Storage Tanks: ASME Code steel construction tank of suitable size and capacity:
 - a. Orientation: Horizontal.

- b. Orientation: Vertical.
 - 6. Plain Steel, Pressure Water Storage Tanks: Steel construction tank of suitable size and capacity:
 - a. Orientation: Horizontal.
 - b. Orientation: Vertical.
 - 7. Plain Steel, Nonpressure Water Storage Tanks: ASME Code steel construction tank of suitable size and capacity:
 - a. Orientation: Horizontal.
 - a. Orientation: Vertical.
 - 8. Plain Steel, Nonpressure Water Storage Tanks: Steel construction tank of suitable size and capacity:
 - a. Orientation: Horizontal.
 - b. Orientation: Vertical.
 - 9. Steel, Floating Wafer Water Storage Tanks: Vertical tank with floating wafer separator, ASME Code steel construction of suitable size and capacity.
 - 10. Steel, Floating Wafer Water Storage Tanks: Vertical tank with floating wafer separator, steel construction of suitable size and capacity.
 - 11. Steel, Precharged Water Storage Tanks: ASTM Code steel construction of suitable size and capacity.
 - a. Operation: Butyl-rubber diaphragm.
 - b. Operation: Butyl-rubber bladder.
 - 12. Steel, Precharged Water Storage Tanks: Steel construction. of suitable size and capacity.
 - a. Operation: Butyl-rubber diaphragm.
 - b. Operation: Butyl-rubber bladder.
 - 13. Plastic Water Storage Tanks: Horizontal plastic tank of suitable material, size and construction.
 - 14. Plastic Water Storage Tanks: Vertical plastic tank of suitable material, size and construction.
 - 15. Steel, Gravity and Surge Water Storage Tanks: Nonpressure rated factory-fabricated steel construction of suitable size and capacity.
 - 16. Steel, Gravity and Surge Water Storage Tanks: Nonpressure rated field-fabricated steel construction of suitable size and capacity.
 - 17. Construction: Non-toxic welded joints; interior lining suitable for service.
 - a. Lining: Glass.
 - 18. Accessories: Manholes, tappings, valves, gages, controls, compression stops, concrete base.
- B. Water Softener Equipment:
- 1. Softener Tanks: Steel tanks, ASME labeled for 100 psig, hydrostatically tested at 150 psig; 50 percent freeboard for backwash expansion.
 - 2. Softener Tanks: Fiberglass tanks, ASME labeled for 100 psig, hydrostatically tested at 150 psig; 50 percent freeboard for backwash expansion.
 - 3. Softener Tank Distribution Systems: Single point upper distribution system of Schedule 40 galvanized steel pipe and fittings; lower distribution of Schedule 40 PVC pipe with PE strainers.
 - 4. Chemicals: High-capacity exchange resin of sulfonated polystyrene; high-purity pellet salt.
 - 5. Brine Tanks: Single brine measuring and dry salt storage tank for 4 regenerations at full salting.
 - 6. Controls: Automatic multiport main operating valve, flow controller, water meter, meter controls.
 - 7. Accessories: Pressure gages, sampling cocks, position indicator, concrete base.
 - 8. Water Testing Sets: Complete for harness tests, wall mounted.
- C. Water Heaters:
- 1. Point-of-Use Storage Electric Water Heaters: Automatic type with 150 psig rated storage tank, integral controls, relief valve.

2. Point-of-Use Tankless Electric Water Heaters: Automatic type, wall-mounted tankless type with integral controls.
3. Electric Water Heaters: Automatic type, vertical 150 psig rated storage tank, integral controls, drain valve, relief valve.
4. Electric Water Heaters: Automatic type, horizontal 150 psig rated storage tank, integral controls, drain valve, relief valve.
5. Electric Booster Heaters: Automatic type, 150 psig rated storage tank, integral controls, drain valve, relief valve.
6. Atmospheric Gas-Fired Water Heaters: Automatic type, vertical 150 psig rated storage tank, burner, controls, draft diverter, drain valve, gas regulator, relief valve.
7. Gas-Fired Copper Finned-Tube Water Heaters: Packaged automatic 160 psig rated finned-tube heat exchanger with controls, draft diverter, burner, gas train and circulating pump.
8. Power Gas-Fired Water Heaters: Automatic type, 150 psig rated tank with controls, draft regulator, burner, gas train and relief valve.
9. Oil-Fired Water Heaters: Automatic type, vertical 150 psig rated storage tank, burner, controls, draft regulator, drain valve, relief valve.
10. Accessories: Valves, gages, concrete base.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 15900

HEATING, VENTILATING, AND AIR CONDITIONING

NOTE: Use this Section for Heating, Ventilating, and Air Conditioning when you want to specify all work of this type in a single section.

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide mechanical systems including:
 - 1. Heating system including boiler.
 - 2. Ventilating system including fans, sheet metal work, registers, grilles and diffusers.
 - 3. Exhaust system for kitchens and laundry equipment.
 - 4. Air conditioning system including chiller.
 - 5. Humidification system.
 - 6. Piping distribution system and insulation.
 - 7. Motor starters.
 - 8. Temperature controls.
 - 9. Fire and life safety controls.
 - 10. Testing, adjusting and balancing.
 - 11. Access panels.
 - 12. Modify and extend existing service to accommodate new work. Relocate existing components as required for new system.
- B. Coordinate with Owner's room uses to provide adequate system for all contract areas.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Piping:
 - 1. Steel: Schedule 40 Seamless Black Steel: ASTM A 53, Grade A;
 - 2. Copper: ASTM B 88 Type L.
 - 3. PVC: Schedule 40 with solvent joints.
- B. Valves: Gate, globe, check, and ball valves. Kennedy, Crane, Nibco, or approved equal.
- C. Hangers and supports: ANSI B31.1.

- D. Convector: Copper tubes with aluminum fins, 16 gauge steel front and top panels by Trane, Airtherm, or approved equal.
- E. Unit heaters: Copper tube coils with aluminum fins, baked enamel steel enclosure by Trane, Airtherm, or approved equal.
- F. Components: Automatic air vents, thermometers, pressure gauges, expansion joints, regulating valves, air separators, expansion tanks, and pumps.
- G. Sheet Metal Work And Accessories: Comply with SMACNA Duct Manual and Sheet Metal Construction for Ventilating and Air Conditioning Systems.
- H. Fans And Air Handling Units: Carrier, Trane, Penn Ventilator, or approved equal.
- I. Grilles And Registers: Units with approved face and frame design, gaskets, and baked enamel finish by Agitair, Titus or approved equal.
- J. Fan Coil Units: 22 gauge galvanized steel with seamless copper tube and aluminum fin coil by Trane, Carrier, Airtherm, or approved equal.
- K. Controls: Automatic temperature control system by Honeywell, Johnson Controls or approved equal. Thermostats and aquastats.
- L. Boilers: Cast iron hot water boiler complying with ASME Code including
 - 1. Manufacturers: Metalbestos, or approved equal
 - 2. Operating and high limit control.
 - 3. Burner, and low water cutoff and relief valve.
 - 4. Double-walled preinsulated sheet metal chimney
 - 5. Sheet metal insulated breeching, 16 gauge.
- M. Access panels: Metal units with locks by Karp, Milcor, Nystrom or approved equal. Configuration and trim as required by finish wall surface.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Install shutoff valves on each piece of equipment on both hot and cold water supply.
- D. Install ductwork in accordance with SMACNA recommendations. Seal duct seams with sealer. Provide splitters and balancing dampers. Provide fire dampers and automatic smoke and fire dampers where required. Provide flexible connectors and inlet and discharge connections. Clean before testing and balancing.
- E. Clearly label and tag all components.
- F. Test and balance all systems for proper operation.

- G. Restore damaged finishes. Clean and protect work from damage.
- H. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16000

ELECTRICAL

NOTE: Use this Section for Electrical Work when you want to specify all work of this type in a single section.

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide electrical systems including:
 - 1. Power.
 - 2. Lighting.
 - 3. Exit lighting.
 - 4. Emergency lighting.
 - 5. Standby emergency generator system.
 - 6. Site lighting.
 - 7. Electric heating equipment.
 - 8. Sound system.
 - 9. Life safety systems.
 - 10. Security systems.
 - 11. Master TV/radio antenna system.
 - 12. Cable TV system.
 - 13. Lightning protection system.
- B. Include primary service, transformers, distribution center, grounding, power and lighting panels, wiring, outlet boxes, receptacles, lighting fixtures, switches, conduits, and raceways and all accessories.
- C. Provide telephone and data outlets with cutout, box and pull string only.
- D. Modify and extend existing service to accommodate new work. Re-lamp existing fixtures consistent with building standards. Remove existing systems and wiring, which are abandoned.
- E. Maintain fire alarm system in operation during construction.
- F. Coordinate with Owner's room uses to provide adequate system for all contract areas.
- G. Coordinate location of ductwork and fire protection systems to avoid interference with location of designated lighting fixture locations. Notify Owner prior to construction of conflicts, which cannot be resolved.
- H. Coordinate schedule of telephone and data outlet completion with Owner's communications requirements and installer as applicable.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Arrangement of systems indicated on the drawings is diagrammatic, and indicates the minimum requirements for electrical work. Site conditions shall determine the actual arrangement of conduits, boxes, and similar items. Take field measurements before fabrication. Be responsible for accuracy of dimensions and layout.
- C. Comply with the National Electrical Code and applicable local regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Conduit: Rigid galvanized metal conduit, intermediate metallic conduit, electrical metallic tubing for concealed interior raceways, flexible metal conduit, and rigid nonmetallic conduit as required.
- B. Exposed metal raceways by Wiremold, Walker Parkersburg or approved equal where wiring cannot be concealed.
- C. Boxes: Provide galvanized steel outlet, junction and pull boxes sized to meet requirements of National Electrical Code. Provide outlet boxes for 48 volt emergency lights with blank covers painted yellow.
- D. Conductors and wiring: 600 volt insulation type THWN or THHN copper wiring for branch circuits. Conductors AWG No. 12 shall be solid. Conductors AWG No. 10 and larger stranded. Minimum conductor size AWG No. 12. Green ground conductor in all raceways. Other sizes as required by service intended.
- E. Wiring devices: Receptacles, lighting switches, ground fault receptacles, dimmers, and coverplates as required.
- F. Panelboards as required by National Electrical Code.
- G. Fixtures: Fluorescent fixtures with ETL/CBM approved high power factor with quiet energy-saving rapid-start ballasts. Provide wattmiser lamps and acrylic prismatic lenses.
- H. Occupancy sensors: Ceiling-mounted occupancy sensors by Unenco or approved equal to control light fixtures in designated areas such as toilet and utility rooms.
- I. Emergency generator: Engine generator set rated for project requirements. Provide starting batteries, automatic transfer switch, annunciator panel, overcurrent protection.
- J. Transformers: High voltage transformers suitable for building requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Comply with National Electrical Code and building code requirements. Maintain continuity of circuits required to supply new or existing equipment in service.
- C. Center ceiling-mounted elements in center of ceiling tiles as applicable.
- D. Install light switches 48" above finished floor. Locate switches within rooms at strike side of door unless noted otherwise.
- E. Install thermostats centered above light switches at 60" above finished floor.
- F. Gang-mount multiple switching locations. Mount multiple types of controls as close together as possible and in-line with each other at a height of 48" above finished floor.
- G. Group multiple junction boxes, telephone and electrical outlets together on wall not more than 6" apart. Avoid back-to-back box locations.
- H. Mount electrical, data, and telephone outlets vertically, 18" above finished floor unless noted otherwise.
- I. Test all systems for proper operation. Restore damaged finishes. Clean and protect work from damage.
- J. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. Electrical Systems for the Following Applications: Refer to individual specification sections following for detailed requirements.
 - 1. Power and distribution.
 - 2. Lighting, exterior and interior, including exit and emergency lighting.
 - 3. Emergency generator.
 - 4. Fire alarm, smoke detection, carbon monoxide detection, and life safety.
 - 5. Security.
 - 6. Lightning protection.
 - 7. Clock and program.
 - 8. Telephone.
 - 9. Computer/local area network.
 - 10. Nurse call.
 - 11. Intercom.
 - 12. Public address.
 - 13. Sound masking.
 - 14. Cable television.
 - 15. Master antenna.
 - 16. Empty conduit system.
 - 17. Power connections for HVAC and plumbing equipment.
 - 18. Power connections for specialty equipment.
 - 19. Modifications to existing systems.
- B. Preliminary Connected Loads:
 - 1. Public Area Lighting: 500 kVA.
 - 2. Internal Operations Lighting: 2.5 watts/sq.ft.
 - 3. Internal Operations Lighting: 150 kVA.
 - 4. Garage Lighting: 0.5 watts/sq.ft.
 - 5. Garage Lighting: 50 kVA.
 - 6. Site Lighting: 30 kVA.
 - 7. Convenience Power: 2 watts/sq.ft.
 - 8. Convenience Power: 300 kVA.
 - 9. Mechanical Cooling: 1000 kVA.
 - 10. Mechanical and Plumbing Equipment: 1200 kVA.
 - 11. Elevators: 150 kVA.
 - 12. Emergency Generator System: 600 kVA for life safety, elevator, security, sump pumps, paging systems, and kitchen coolers.
- C. Illumination Levels:
 - 1. Public Areas: 70 footcandles.
 - 2. Offices: 70 footcandles.
 - 3. Circulation: 70 footcandles.
 - 4. Kitchen: 70 footcandles.
 - 5. Storage: 20 footcandles.
 - 6. Mechanical: 20 footcandles.
 - 7. Garage: 15 footcandles.
 - 8. Parking Lots: 5 footcandles (54 lux).

- D. Additional Requirements: [Add project specific information either in this section or in individual specification sections. Include such items as service voltage, service size, power company class of service, location of primary feeders, meters, class of hazardous areas, expected fault current, and similar items.]

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Systems, products, and standards are listed in individual specification sections, which follow.

PART 3 - EXECUTION

Not Applicable To This Section

END OF SECTION

SECTION 16120
CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wires, cables, and connectors for power, lighting, signal, control and related systems rated 600 volts and less.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: National Electrical Code; UL 4, 83, 486A, 486B, 854; NEMA/ICEA WC-5, WC- 7, WC-8; IEEE 82.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wire Components:
 - 1. Conductors for Power and Lighting Circuits: Solid conductors for No. 10 AWG and smaller; stranded conductors for No. 8 AWG and larger.
 - 2. Insulation: THHN/THWN for conductors size 500MCM and larger and No. 8 AWG and smaller; THW, THHN/THWN or XHHW insulation for other sizes based on location.
 - 3. Jackets: Factory-applied nylon or PVC.
 - 4. Conductor Material: Copper.
 - 5. Conductor Material: Copper-clad aluminum.
 - 6. Conductor Material: Aluminum.
- B. Cables:
 - 1. Armored Cable for Gypsum Board Partitions and Connections from Raceway Outlet Boxes to Lighting Fixtures: UL Types AC.
 - 2. Metal-Clad Cable in Cable Trays: UL Type MC.
 - 3. Nonmetallic-Sheathed Cable for Lighting Wiring: UL Type NM and NMC.
 - 4. Aboveground Service Entrance Cable: UL Type SE.
 - 5. Underground Service Entrance Cable: UL Type USE.

6. Underground Feeder and Branch-Circuit Cable: UL Type UF.
 7. Portable Cord for Flexible Pendant Leads to Outlets and Equipment: UL Type S.
 8. Control/Signal Transmission Media: Single conductor coaxial type with polyethylene core; twisted pair, direct burial, aerial, plenum and video types.
 9. Flat Cabling System for Power Under Carpet Tile: Factory-laminated three-piece assembly including bottom shield, conductor assembly, and ground shield.
 10. Flat Cabling System for Telephone and Data Transmission Under Carpet Tile: Flat cable with capacity required.
 11. Fiber Optic Cables: Single channel low-loss glass type, fiber optic multimode graded-index cables, including connectors, couples, transmitters, receivers, sources and detectors.
- C. Connectors: UL listed solderless metal connectors with appropriate temperature ratings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16130

RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide electrical conduit, tubing, surface raceways, wireways, cable trays, boxes, and cabinets for electrical power and signal distribution.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.01 QUALITY ASSURANCE

- D. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wiring Methods:

1. Exposed Indoor Wiring: Electrical metallic tubing or rigid nonmetallic conduit 6 feet or more above finished floor; galvanized steel conduit below 6 feet above finished floor.
2. Concealed Indoor Wiring: Electrical metallic tubing, electrical nonmetallic tubing, or rigid nonmetallic conduit.
3. Exposed Outdoor Wiring: Intermediate steel conduit.
4. Concealed Outdoor Wiring: Intermediate steel conduit.
5. Underground Wiring, Single Run: Rigid nonmetallic conduit.
6. Underground Wiring, Grouped: Rigid nonmetallic conduit.
7. Connection to Vibrating Equipment: Flexible Metal conduit, liquidtight at exterior.

B. Metal Conduit and Tubing:

1. Rigid Aluminum Conduit: ANSI C80.5.
2. Rigid Steel Conduit: ANSI C80.1.
3. Intermediate Steel Conduit: UL 1242.
4. PVC Externally Coated Rigid Steel Conduit and Fittings: ANSI C80.1 and NEMA RN 1.
5. Electrical Metallic Tubing (EMT) and Fittings: ANSI C80.3.
6. PVC Externally-Coated Electrical Metallic Tubing and Fittings: ANSI C80.3 and NEMA RN 1.
7. Flexible Metal Conduit: UL 1 aluminum.
8. Flexible Metal Conduit: UL 1 zinc-coated steel.

9. Liquidtight Flexible Metal Conduit and Fittings: UL 360.
- C. Nonmetallic Conduit and Ducts:
 1. Electrical Nonmetallic Tubing (ENT): NEMA TC 13.
 2. Rigid Nonmetallic Conduit (RNC): NEMA TC 2 and UL 651, Schedule 40 or 80 PVC.
 3. Underground PVC and ABS Plastic Utilities Duct: NEMA TC 6, Type I for encased burial in concrete, Type II for direct burial.
 4. PVC and ABS Plastic Utilities Duct Fittings: NEMA TC 9.
 5. Liquidtight Flexible Nonmetallic Conduit and Fittings: UL 1660.
- D. Raceway Accessory Materials:
 1. Conduit Bodies: NEC requirements.
 2. Wireways: NEC requirements.
 3. Surface Raceways, Metallic: Galvanized steel, with snap-on covers.
 4. Surface Raceways, Nonmetallic: Rigid PVC, UL 94.
- E. Cable Trays:
 1. Materials: Mill galvanized steel.
 2. Materials: Hot-dip galvanized steel.
 3. Materials: PVC-coated steel.
 4. Configuration: Ladder type, trough-type, solid-bottom type, channel type.
 5. Covers: Solid type, louvered type, and ventilated-hat type.
- F. Boxes and Fittings:
 1. Cabinet Boxes: UL 50, sheet steel, NEMA 1.
 2. Pull and Junction Boxes: UL 50, steel boxes.
 3. Metal Outlet, Device and Small Wiring Boxes: UL 514A and OS 1.
 4. Nonmetallic Outlet, Device and Small Wiring Boxes: NEMA OS 2.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16140
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wiring devices for electrical service.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: National Electrical Code, NEMA WD 1, UL.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wiring Devices and Components:
 - 1. Receptacles: UL 498 and NEMA WD 1.
 - 2. Industrial Receptacles: UL 498 pin and sleeve type; UL 1010 at hazardous locations.
 - 3. Ground-Fault Interrupter (GFI) Receptacles: Feed-thru type ground-fault circuit interrupter with integral duplex receptacles.
 - 4. Isolated Ground Receptacles: Listed and labeled, equipment grounding contacts integral to receptacle construction.
 - 5. Plugs: 15 amperes, 125 volts, 3 wire, grounding, armored cap plugs.
 - 6. Plug Connectors: 15 amperes, 125 volts, bakelite-body armored connectors, 3 wire, grounding with cord clamp.
 - 7. Snap Switches: UL 20 and NEMA WD 1, AC switches.
 - 8. Combination Switch and Receptacles: 3-way switch, 20 amperes, AC with toggle switch handle, 3 wire grounding receptacle, 15 amperes, 120 volts.
 - 9. Dimmer Switches, Incandescent Lamps: NEMA WD 1, solid state modular dimmer switches, 120 volts, 60 Hertz, adjustable rotary knob.
 - 10. Dimmer Switches, Fluorescent Lamps: Full-wave modular type AC dimmer with electromagnetic filters.
 - 11. Telephone Jacks: 8-position modular, flush in face of wall, plated.
 - 12. Telephone Jacks: 4-position modular, flush in face of wall, plated.

13. Wall Plates: Single and combination types, steel plate with baked-on finish.
14. Floor Service Outlets: Modular, above-floor type floor service outlets and fittings.
15. Poke-Through Assembly Devices: Device with above-floor service outlets, multi-channelled through-floor raceway firestop assembly and below-floor junction box assembly.
16. Telephone/Power Service Poles: Combination telephone and power poles with ceiling and floor trim.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16230
GENERATOR ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide packaged diesel engine generator system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 110.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Packaged Engine Generator System Characteristics:
 - 1. Ratings: Voltage, frequency, and power output ratings suitable for use.
 - 2. Maximum Transfer Time to Assume Full Load: Suitable for service.
 - 3. Fuel Supply: 48 hours of operation.
 - 4. Type: Standby-rated automatically started diesel engine coupled to an AC generator unit.
 - 5. Type: Standby-rated manually started diesel engine coupled to an AC generator unit.
- B. Packaged Engine Generator System Components:
 - 1. Engine: NFPA 37.
 - 2. Engine Fuel: Diesel fuel oil grade DF-2.
 - 3. Cooling System: Closed-loop, liquid-cooled, radiator mounted on generator set base.
 - 4. Fuel Supply System: NFPA 30, 37; day tank, redundant high-level fuel shutoff, fuel piping and storage tank.
 - 5. Engine Exhaust System: Muffler type suitable for use.
 - 6. Combustion Air-Intake System: Filter type air intake silencer, intake duct and connections.
 - 7. Starting System: Electric with negative ground.
 - 8. Control and Monitoring: Operating and safety indications, protective devices, basic system controls, engine gages.
 - 9. Generator, Exciter, and Voltage Regulator: NEMA MG 1, direct drive.

10. Load Bank: Permanent outdoor, remotely controlled, forced-air cooled, resistive/reactive unit.
11. Outdoor Generator Set Enclosure: Weatherproof steel housing, louvers, dampers.
12. Transfer Switches: Manual 3-pole, applicable to service required.
13. Transfer Switches: Manual 4-pole, applicable to service required.
14. Transfer Switches: Automatic 3-pole, applicable to service required.
15. Transfer Switches: Automatic 4-pole, applicable to service required.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16510
INTERIOR LUMINAIRES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide interior lighting fixtures, lamps, ballasts, emergency lighting units, and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 70 "National Electrical Code."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Interior Lighting Components:
 - 1. Fluorescent Fixtures: Fixtures, UL 1570; ballasts, UL 935, energy-saving, electronic, and dimming types; air handling fixtures.
 - 2. High Intensity Discharge (HID) Fixtures: UL 1572; ballasts, UL 1029; instant restrike device.
 - 3. Incandescent Fixtures: UL 1571.
 - 4. Fixtures for Hazardous Locations: UL 844.
 - 5. Track Lighting Systems: UL 1574.
 - 6. Exit Signs: UL 924, self-powered battery type and self-powered luminous source type.
 - 7. Emergency Lighting Units: UL 924.
 - 8. Emergency Fluorescent Power Supply: UL 924.
 - 9. Lamps: ANSI Standards, C78 series.
 - 10. Suspended Fixture Support Components: Stem, rod, and hook hangers.

2.2 SCHEDULE

- A. Interior Lighting Fixture Schedule: [Insert preliminary description or schedule, or delete this paragraph if fixture schedule on Drawings.]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Test all systems for proper operation. Label circuits in electrical panels.
- D. Restore damaged finishes. Clean and protect work from damage.
- E. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 16521
EXTERIOR LUMINAIRES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide exterior lighting fixtures, lamps, ballasts, poles, standards, and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 70 "National Electrical Code."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Exterior Lighting Components:
 - 1. Fluorescent Fixtures: Fixtures, UL 1570; ballasts, UL 935, energy-saving and electronic types.
 - 2. High Intensity Discharge (HID) Fixtures: UL 1572; ballasts, UL 1029; instant restrike device.
 - 3. Incandescent Fixtures: UL 1571.
 - 4. Lamps: ANSI Standards, C78 series.
 - 5. Fixture Support Poles, Mast Arms and Brackets:
 - a. Steel tubing.
 - b. Aluminum.
 - c. Fiberglass.
 - d. Laminated wood.
 - e. Pressure-treated wood.
 - f. Prestressed concrete.

2.2 SCHEDULE

- A. Exterior Lighting Fixture Schedule: [Insert preliminary description or schedule, or delete this paragraph if fixture schedule on Drawings.]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Clearly label and tag all components.
- C. Test and balance all systems for proper operation.
- D. Restore damaged finishes. Clean and protect work from damage.
- E. Instruct Owner's personnel in proper operation of systems.

END OF SECTION