

# **SPECIFICATIONS**

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**City of Beverly Hills –  
Fire Station # 2 –Tenant Improvement  
1100 COLDWATER CANYON DRIVE  
BEVERLY HILLS, CALIFORNIA**

**JULY 6, 2017  
RTK PROJECT No. 16-12400**

Prepared by:

**RTK ARCHITECTS INC.**  
3975 Landmark Street, Suite 400, Culver City, California 90232



**SECTION 00 00 20**

**PROJECT DIRECTORY**

**Owner:** CITY OF BEVERLY HILLS  
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## **SECTION 01 10 00**

### **SUMMARY**

#### **PART 1 GENERAL**

##### **1.01 PROJECT**

- A. Project Name: Beverly Hills Fire Station Remodel
- B. Owner's Name: City of Beverly Hills
- C. Contacts: Karen Domerchie – Project Manager, Project Administration
- D. Design Professional's Name: RTK Architects, Inc.
- E. Contact: Phil Trigas, Architect
- F. The Project consists of a partial remodeling of first floor, yard area and fence at Fire Station No. 2

##### **1.02 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00500 - Agreement.

##### **1.03 DESCRIPTION OF ALTERATIONS WORK**

- A. Scope of demolition and removal work is shown on drawings and specified in Section 020700.
- B. Scope of alterations work is shown on drawings.
- C. Plumbing: Alter existing system, keeping existing in operation.
- D. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- E. Fire Suppression Sprinklers: Keeping existing in operation.
- F. Fire Alarm: Keeping existing in operation.
- G. Telephone: Alter existing system, keeping existing in operation.
- H. Owner will remove the following items before start of work:
  - 1. Furniture
  - 2. Miscellaneous Accessories
  - 3. Personal Items

##### **1.04 WORK BY OWNER**

- A. Items noted OFCI will be supplied by the owner and installed by the contractor before Substantial Completion.
  - 1. Metal Storage Shelving.
- B. Owner will supply and install the following:
  - 1. Security system.
  - 2. Signage (other than required ADA signage)
  - 3. Furnishing
  - 4. Equipment
  - 5. Artwork

### 1.05 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy a certain portion of the Project prior to the completion date for the conduct of normal operations.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

### 1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
  - 1. Owner occupancy.
  - 2. Work by Others.
  - 3. Work by Owner.
  - 4. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by Owner:
  - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- D. Existing building spaces may not be used for storage.
- E. Time Restrictions:
  - 1. Limit conduct of especially noisy exterior work to weekdays, 8 a.m. to 6 p.m.
  - 2. Limit conduct of especially noisy interior work to hours of, 7 a.m. to 8 p.m.
- F. Utility Outages and Shutdown:
  - 1. The Facility is a 24/7 facility.
  - 2. Contractor to provide a 24-hour notice to owner's representative for utility shut-downs.
- G. Two temporary trailers will be set at the parking lot southwest of the fire station during the tenant improvement construction. The trailers will be set before the tenant improvement construction begins and will house the TV Room, Kitchen, and Sleeping Quarters for the Fire Department staff. These trailers, and the work associated with these trailers, is not a part of this contract. However, Contractor should be aware that areas in the fire station will still be occupied by Fire Department staff during construction. These areas include:
  - Hall 103
  - Women's Restroom 107
  - Men's Restroom 108
  - Fitness Room 109
  - Half of Apparatus 113 (See item No.2 below)
  - Study 115
- H. Hall 103 : Work at Hall 103 will need to be coordinated with Fire Department staff. Contractor to ensure that access to the building is available to the Fire Department staff, and that the areas above are safe, clean and free of dust and debris.
- J. Add Alternate No. 1: If Add Alternate No. 1 is accepted and included in the contract, Contractor will need to prepare and apply new flooring at the Apparatus area such that the Fire Department staff can still utilize half of the Apparatus area to park fire trucks and be functional during this work.

## **1.07 WORK SEQUENCE**

- A. Contractor to examine example Phasing Schedule provided and prepare a construction phasing plan. The final phasing plan must be approved prior to start of work. Any necessary amendments must be presented in written form and approved prior to work in areas affected by amendment.
- B. Coordinate construction schedule, phasing plan, and operations with Owner and Architect.

## **1.08 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS**

- A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.
- B. Section 01 21 00 - Allowances.
- C. Section 01 23 00 - Alternatives.
- D. Section 01 40 00 - Quality Requirements.
- E. Section 01 42 00 - Reference Standards.
- F. Section 01 53 00 - Temporary Facilities and Controls.
- G. Section 01 65 00 - Project Storage and Handling
- H. Section 01 70 00 - Execution Requirements.
- I. Section 01 78 00 - Closeout Submittals.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

NOT USED.



## **SECTION 01 17 00**

### **REQUESTS FOR INFORMATION**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. This Section describes procedures for requesting information other than that shown in the Contract Documents, and discusses conditions under which such requests will be considered.

##### **1.02 REQUESTS FOR INFORMATION**

- A. Assumption of prior knowledge:
  - 1. Instructions to Bidders for this Work state requirements that, prior to submitting a bid, bidders become thoroughly familiar with the proposed Contract Documents and that they request and secure clarification of all matters on which there may be any question as to design intent.
  - 2. Reasons for these requirements include the Owner's wish:
    - a. That bidders have complete and adequate knowledge of the proposed Work in order to propose a fair and proper bid price;
    - b. To avoid unnecessary time-consuming and effort-consuming requests for information during progress of the Work; and
    - c. To discourage frivolous requests for information while encouraging acquisition of complete familiarity with the Drawings, Specifications, and other Documents of the Contract.
- B. However, the Owner and the Architect recognize that data may inadvertently have been omitted from the Contract Documents or require clarification of alleged conflict of data, and the following procedures are established for requesting such data.
- C. Procedures:
  - 1. Prior to requesting information, conduct a thorough search of the Contract Documents and determine that the information is apparently missing from the Contract Documents or requires clarification of an alleged conflict of data.
  - 2. Fill out a "Request for Information" form and deliver it to the Architect.
  - 3. The Architect will conduct the necessary search.
  - 4. Within five (5) calendar days, the Architect will respond to the Request for Information.
    - a. Should the information be missing, or require clarification, the Architect will respond by giving the proper information to the Contractor.

**END OF SECTION**

- H. Section 01 70 00 - Execution Requirements.
- I. Section 01 78 00 - Closeout Submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## **SECTION 01 21 00**

### **ALLOWANCES**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

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

##### **1.02 RELATED SECTIONS**

- A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

##### **1.03 CASH ALLOWANCES**

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

##### **1.04 CONTINGENCY ALLOWANCE – Not Used.**

##### **1.05 INSPECTING AND TESTING ALLOWANCES – Not Used.**

##### **1.06 ALLOWANCES SCHEDULE**

- A. **Allowance # 1**  
Include an allowance of \$ 9,000.00 for monitoring of asbestos and lead abatement activities of the certified abatement contractor.
- B. **Allowance # 2**  
Include an allowance of \$ 8,500.00 for provision of Data and Communication cabling including Terminations. The above allowance does not include Installation of conduits and back boxes.

**C. Allowance # 3**

Include an allowance of \$ 16,000.00 to provide and install Access Control System  
Including 3 card key pad and 4 reader AMMAG controller (Reference 2/E-2.0)  
The above allowance does not include conduits and back boxes.

**PART 2 – PRODUCTS - NOT USED**

**PART 3 – EXECUTION - NOT USED**

**END OF SECTION**

## **SECTION 01 23 00**

### **ALTERNATIVES**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Alternative submission procedures.
- B. Documentation of changes to Contract Sum and Contract Time.

##### **1.02 RELATED SECTIONS**

- A. Document 00200 - Instructions to Bidders: Instructions for preparation of pricing for alternatives.
- B. Document 00433 - Supplement C - Alternatives: List of alternatives as supplement to Bid Form.
- C. Document 00500 - Agreement: Incorporating monetary value of accepted alternatives.

##### **1.03 ACCEPTANCE OF ALTERNATIVES**

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

##### **1.04 SCHEDULE OF ALTERNATIVES**

- A. **Alternative No. 1:**  
Alternative Item: Provide Stonhard finish at Apparatus Floor and Surrounding Areas. Refer to sheet A-2.1 and Specifications sections 09 67 23 and 09 96 00.
- B. **Alternative No. 2:**  
Alternative Item: New trash enclosure and vehicular gate per sheet A-2.3 with associated demo delineate per sheet A-1.2, and E-5.1.
- C. **Alternative No. 3:**  
Alternative Item: At Shop Area #115; removal of existing cabinetry and providing new cabinetry and indicated electrical work as delineated on Sheet# A-1.1, A-2.1,1/A-3.0, E-4.0 and E-5.0 .
- D. **Alternative No. 4:**  
Alternative Item: Not used.
- E. **Alternative No. 5:**  
Alternative Item: Removal of Existing Apparatus doors and providing new exterior swinging four-fold door system per specification Section 08 35 13 and drawing sheet# A-5.0

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## **SECTION 01 31 19**

### **PROJECT MEETINGS**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Construction Manager will conduct project meetings throughout the construction period.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.

##### **1.02 SUBMITTALS**

- A. Agenda items: To the maximum extent practicable, advise the Architect at least 24 hours in advance of project meetings regarding items to be added to the agenda.
- B. Minutes:
  - 1. The Construction Manager will compile minutes of each project meeting, and will furnish required copies to the Contractor and required copies to the Owner.
  - 2. Recipients of copies may make and distribute such other copies as they wish.

##### **1.03 QUALITY ASSURANCE**

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

#### **PART 2 - PRODUCTS**

(No products are required in this Section)

#### **PART 3 - EXECUTION**

##### **3.01 MEETING SCHEDULE**

- A. Except as noted below for Preconstruction Meeting, project meetings will be held weekly, or as designated by the Construction manager.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

##### **3.02 MEETING LOCATION**

- A. The Construction manager will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

### **3.03 PRECONSTRUCTION MEETING**

- A. Preconstruction Meeting will be scheduled to be held within -- working days after the Owner has issued the Notice to Proceed.
  - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
  - 2. The Architect will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum agenda: Data will be distributed and discussed on at least the following items:
  - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, Construction manager and Architect.
  - 2. Channels and procedures for communications.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract Documents, including distribution of required copies of original Documents and revisions.
  - 5. Processing of Shop Drawings and other data submitted to the Architect for review.
  - 6. Processing of Bulletins, field decisions, and Change Orders.
  - 7. Rules and regulations governing performance of the Work; and
  - 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.
  - 9. Record drawings and payment schedules.

### **3.04 PROJECT MEETINGS**

- A. Attendance:
  - 1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
  - 2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.
- B. Minimum agenda:
  - 1. Review, revise as necessary, and approve minutes of previous meetings.
  - 2. Review progress of the Work since last meeting, including status of submittals for approval.
  - 3. Identify problems which impede planned progress.
  - 4. Develop corrective measures and procedures to regain planned schedule.
  - 5. Complete other current business.
- C. Revisions to minutes:
  - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
  - 2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
  - 3. Challenge to minutes shall be settled as priority portions of "old business" at the next regularly scheduled meeting.

## **SECTION 01 32 16**

### **CONSTRUCTION PROGRESS SCHEDULES**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. To assure adequate planning and execution of the Work so that the Work is completed within the number of calendar days allowed in the Contract, and to assist the Architect in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work, prepare and maintain the schedules and reports described in this Section.
- B. Related work:
  - 1. Requirements for progress schedule: Bid Package.
  - 2. Construction period: Form of Agreement.

##### **1.02 SUBMITTALS**

- A. Comply with pertinent provisions of Section 01 33 23..
- B. Preliminary analysis: Within ten calendar days after the Contractor has received the Owner's Notice to Proceed, submit one digital file and four prints of a preliminary construction schedule prepared in accordance with Part 3 of this Section.
- C. Construction schedule: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit one reproducible copy and four prints of a construction schedule prepared in accordance with Part 3 of this Section.
- D. Periodic reports: On the first working day of each month following the submittal described in Paragraph 1.2-C above, submit four prints of the construction schedule updated as described in Part 3 of this Section.

##### **1.03 QUALITY ASSURANCE**

- A. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, and in preparing and issuing periodic reports as required below.
- B. Reliance upon the approved schedule:
  - 1. The construction schedule as approved by the Architect and the Owner will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
  - 2. Should any activity not be completed within 15 days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means the Owner deems appropriate and necessary, without additional compensation to the Contractor.
  - 3. Should any activity be 30 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
  - 4. Costs incurred by the Owner and by the Architect in connection with expediting construction activity under this Article shall be reimbursed by the Contractor.
  - 5. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.



## **PART 2 - PRODUCTS**

### **2.01 CONSTRUCTION ANALYSIS**

- A. Graphically show by bar-chart, or other means acceptable to the Architect, the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram.
- B. Include, but do not necessarily limit indicated activities to:
  - 1. Project mobilization;
  - 2. Submittal and approval of Shop Drawings and Samples;
  - 3. Procurement of equipment and critical materials;
  - 4. Fabrication of special material and equipment, and its installation and testing.
  - 5. Final cleanup;
  - 6. Final inspecting and testing; and
  - 7. All activities by the Architect that effect progress, required dates for completion, or both, for all and each part of the Work.

## **PART 3 - EXECUTION**

### **3.01 PRELIMINARY ANALYSIS**

- A. Contents:
  - 1. Show all activities of the Contractor under this Work for the period between receipt of Notice to Proceed and submittal of construction schedule required under Paragraph 1.2-C above;
  - 2. Show the Contractor's general approach to remainder of the Work;
  - 3. Show cost of all activities scheduled for performance before submittal and approval of the construction schedule.

### **3.02 CONSTRUCTION SCHEDULE**

- A. As required under Paragraph 1.2-D above, update the approved construction schedule.
  - 1. Indicate "actual" progress in percent completion for each activity;
  - 2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.

### **3.03 REVISIONS**

- A. Make only those revisions to approved construction schedule as are approved in advance by the Architect.

**END OF SECTION**

**SUBMITTALS & SUBSTITUTIONS  
SCHEDULE FOR SUBMITTALS  
01 33 23**

		Shop Drawings	Samples	Manufacturer literature	Material List	Tests
<b>Division 4 – Masonry</b>						
042000	Concrete Unit Masonry	X	X	X	X	X
<b>Division 6 – Wood and Plastics</b>						
064000	Architectural Wood Casework	X	X		X	X
064015	Countertops	X	X	X		
<b>Division 7 – Thermal, Moisture and Acoustical</b>						
072100	Building Insulation			X	X	X
076000	Flashing and Sheet Metal	X			X	
079200	Sealant & Caulking	X	X	X	X	
<b>Division 8 – Doors and Windows</b>						
081100	Steel Doors and Frames	X	X	X	X	X
081116	Aluminum Storefront Doors and frames	X	X	X	X	X
081423.16	Plastic Laminate Face Wood Doors	X	X	X	X	X
083100	Access Doors and Panels			X	X	X
083510	Exterior Swinging Four-Fold Door Systems	X	X	X	X	X
087100	Door Hardware	X	X	X	X	
088100	Glazing	X	X	X	X	X
<b>Division 9 – Finishes</b>						
092216	Non-Structural Metal Stud Framing			X	X	X
092900	Gypsum Board Assemblies	X	X	X	X	X
093013	Ceramic Tile	X	X	X	X	X
095100	Acoustical Tile Ceilings and Suspension System	X	X	X	X	X
096500	Resilient Flooring	X	X	X	X	X
096813	Carpet Tile	X	X	X	X	X
097200	Wall Covering	X	X	X		
099000	Painting and Coatings	X	X	X	X	X
<b>Division 10 – Specialties</b>						
102813	Toilet Accessories	X	X	X	X	
<b>Division 21, 22, 23 – Mechanical and Plumbing</b>						
211100	Fire Protection (Design/Build – Deferred Approval Item)	X		X	X	X

		Shop Drawings	Samples	Manufacturer literature	Material List	Tests
223000	Plumbing	X		X	X	X
230593	Air System Test & Balance					X
233600	Air Terminals	X	X	X		
235000	HVAC Systems	X		X	X	X
<b>Division 16 – Electrical</b>						
16000	Electrical	X	X	X	X	X

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED SECTIONS**

- A. Document 00700 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 21 00 - Allowances: Allowance for payment of testing services.
- C. Section 01 33 23 - Submittal and Substitutions: Submittal procedures.
- D. Section 01 42 00 - Reference Standards.
- E. Section 01600 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCES**

- A. ASTM C 1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2001.
- B. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2005b.
- C. ASTM C 1093 - Standard Practice for Accreditation of Testing Agencies for Unit Masonry; 2006.
- D. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2004a.
- E. ASTM E 329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2005b.
- F. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing; 2004.

**1.04 SUBMITTALS**

- A. Testing Agency (Services retained by the owner):
  - 1. Prior to start of Work, agency name, address, and telephone number, and names of full time registered Engineer and responsible officer will be published.

2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Design Data: Submit for Design Professional's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Design Professional and to Contractor.
  1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.
    - f. Location in the Project.
    - g. Type of test/inspection.
    - h. Date of test/inspection.
    - i. Results of test/inspection.
    - j. Conformance with Contract Documents.
    - k. When requested by Design Professional, provide interpretation of results.
  2. Test reports are submitted for Design Professional's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or Installation/application subcontractor to Design Professional, in quantities specified for Product Data.
  1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
  2. Certificates may be recent or previous test results on material or product, but must be acceptable to Design Professional.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Design Professional's benefit as contract administrator or for Owner.
  1. Submit report in duplicate within 30 days of observation to Design Professional for information.
  2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- G. Erection Drawings: Submit drawings for Design Professional's benefit as contract administrator or for Owner.
  1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
  2. Data Indicating inappropriate or unacceptable Work may be subject to action by Design Professional or Owner.

## 1.05 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Design Professional before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Design Professional shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### **1.06 TESTING AND INSPECTION AGENCIES**

- A. Owner will employ and pay for services of an independent testing agency to perform specified and other required testing.
- B. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- D. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- E. Contractor Employed Agency:
  1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 543, ASTM C 1021, ASTM C 1077, and ASTM C 1093.
  2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
  3. Laboratory: Authorized to operate in Project Location.
  4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
  5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.01 CONTROL OF INSTALLATION**

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

### **3.02 MOCK-UPS**

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

### **3.03 TOLERANCES**

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

### **3.04 TESTING AND INSPECTION**

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

- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Design Professional. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

### **3.05 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Design Professional 30 days in advance of required observations.
  - 1. Observer subject to approval of Design Professional.
  - 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

### **3.06 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not conforming to specified requirements.

**END OF SECTION**



## **SECTION 01 41 00**

### **REGULATORY REQUIREMENTS**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. This Section describes testing and inspecting to be provided by the Contractor.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Requirements for testing may be described in various Sections of these Specification.

#### **PART 2 - PRODUCTS**

##### **2.01 PAYMENT FOR TESTING**

- A. The Owner will pay for all testing and inspecting required under this Section of these Specifications, and to cover all testing and inspecting required by governmental agencies having jurisdiction. Testing and inspecting specifically requested by the Architect over and above those described above.
- B. When tests requested by the Architect indicate noncompliance with the Contract Documents, all testing and subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.

##### **2.02 SPECIFIC TESTS AND INSPECTIONS**

- A. Tests and inspections will be performed where required by governmental agencies having jurisdiction, required by provisions of the Contract Documents, and such other tests and inspections as are directed by the Architect.
- B. Tests include, but are not necessarily limited to, those described in detail in Part 3 of this Section.

#### **PART 3 - EXECUTION**

##### **3.01 TAKING SPECIMENS**

- A. Except as may be specifically otherwise approved by the Architect, have the testing laboratory secure and handle all samples and specimens for testing.

##### **3.02 COOPERATION WITH TESTING LABORATORY**

- A. Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

##### **3.03 SOIL INSPECTING AND TESTING**

- A. Make required inspections and tests including, but not necessarily limited to:
  - 1. Visually inspect on-site and imported fill and backfill, making such tests and retests as are necessary to determine compliance with the Contract requirements and suitability for the proposed purpose;
  - 2. Make field density tests on samples from in-place material as required;
  - 3. As pertinent, inspect and test the scarifying and recompacting of cleaned subgrade; inspect the progress of excavating, filling, and grading; make 90% density tests at fills and backfills; and verify compliance with provisions of the Contract Documents and governmental agencies having jurisdiction.
- B. Make and distribute necessary reports and certificates.

### **3.04 CONCRETE INSPECTING AND TESTING**

- A. Portland cement:
  - 1. Secure from the cement manufacturer Certificates of Compliance delivered directly to the concrete producer for further delivery directly to the testing laboratory.
  - 2. Require the Certificates of Compliance to positively identify the cement as to production lot, bin or silo number, dating and routing of shipment, and compliance with the specified standards.
  - 3. If so required by the Architect, promptly provide such other specific physical and chemical data as requested.
- B. Aggregate:
  - 1. Provide one test unless character of material changes, material is substituted, or additional test is requested by the Architect.
  - 2. Sample from conveyor belts or batching gates at the ready-mix plant:
    - a. Sieve analysis to determine compliance with specified standards and grading;
    - b. Specific gravity test for compliance with specified standards.
- C. Laboratory design mix:
  - 1. After approval of aggregate, and whenever character or source of materials is changed, provide mix design in accordance with ACI 613.
  - 2. Provide designs for all mixes prepared and signed by a registered California engineer.
- D. Molded concrete cylinders:
  - 1. Provide three test cylinders for each 115 cu m (150 cu yds), or fraction thereof, of each class of concrete of each day's placement.
  - 2. Test one cylinder at seven days, one at 28 days, and one when so directed.
  - 3. Report the mix, slump, gage, location of concrete in the structure, and test results.
  - 4. Take specimens and make tests in accordance with the applicable ASTM standard specifications.
- E. Core tests:
  - 1. Provide only when specifically so directed by the Architect because of low cylinder test results.
  - 2. Cut from locations directed by the Architect, securing in accordance with ASTM C42, and prepare and test in accordance with ASTM C39.
- F. Placement inspections:
  - 1. Provide continuous or other inspection of concrete if required by governmental agencies having jurisdiction.
  - 2. Throughout progress of concrete placement, make slump tests to verify

conformance with specified slump.

3. Using all required personnel and equipment, throughout progress of concrete placement verify that finished concrete surfaces will have the level or slope that is required by the Contract Documents.

### **3.05 CONCRETE REINFORCEMENT INSPECTING AND TESTING**

- A. Prior to use, test all reinforcement steel bars for compliance with the specified standards.
  - 1. Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing.
  - 2. Require the supplier to furnish mill test reports to the testing laboratory for certification.
  - 3. Tag identified steel at the supplier's shop.
  - 4. When steel arrives at the job site without such tags, test it as unidentified steel.
- B. Unidentified steel:
  - 1. Have the testing laboratory select samples consisting of two pieces, each 450 mm (18") long, of each size.
  - 2. Have the testing laboratory make one tensile test and one bend test for each 2250 kg (2-1/2 tons) or fraction thereof of each size of unidentified steel.
- C. Provide continuous inspection for all welding of reinforcement steel.

### **3.06 STRUCTURAL STEEL INSPECTING AND TESTING**

- A. Prior to use, test all structural steel for compliance with the specified standards.
  - 1. Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing.
  - 2. Require the supplier to furnish mill test reports to the laboratory for certification.
  - 3. Tag identified steel at the supplier's shop.
  - 4. When steel arrives at the job site without such tags, test it as unidentified steel.
- B. Unidentified steel:
  - 1. Have testing laboratory make one tensile test and one bend test for each 4500 kg (five tons) or fraction thereof of each shape and size of unidentified structural steel.
- C. Shop welding:
  - 1. Provide qualified testing laboratory inspector.
  - 2. On single pass welds, inspect after completion of welding and prior to painting.
  - 3. On multiple pass welds, and on butt welds with cover pass on the back side, provide continuous inspection.
- D. Field welding: Continuous inspection will be required.

### **3.07 ROOFING AND WATERPROOFING INSPECTING AND TESTING**

- A. Prior to start of membrane waterproofing and membrane roofing installation, conduct a job site meeting attended by representatives of the installing subcontractors, the Contractor's field superintendent, the testing laboratory inspector, the manufacturers representative and the Architect, to agree upon procedures to be followed.
- B. Prior to start of installation, verify that materials at the job site comply with the specified standards, that the subcontractor is qualified to the extent specified, and that the installing personnel are fully informed as to procedures to be followed.

- C. During installation, verify that materials are installed in strict accordance with the manufacturers' recommendations as approved by the Architect.
- D. When so directed by the Architect, make test cuts to verify conformance with the specified requirements.

**3.08 WAIVER OF INSPECTION AND/OR TESTS**

- A. Specified inspections and/or tests may be waived only by the specific approval of the Architect.

**END OF SECTION**

## SECTION 01 42 00

### REFERENCE STANDARDS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

###### A. Work included:

1. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.
2. Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide materials and workmanship which meet or exceed the specifically named code or standard.
3. Proof:
  - a. It is also the Contractor's responsibility, when so required by the Contract Documents or by written request from the Architect, to deliver to the Architect all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard.
  - b. Such proof shall be in the form requested by the Architect, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Architect.

###### B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and other Sections of Division One of these Specifications.
2. Specific naming of codes or standards occurs on the Drawings and/or in these Specifications.

##### 1.02 QUALITY ASSURANCE

- ###### A.
- In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.

###### B. Rejection of non-complying items:

1. The Architect reserves the right to reject items incorporated into the Work which fail to meet the specified minimum requirements.
2. The Architect further reserves the right, and without prejudice to other recourse the Architect may take, to accept non-complying items subject to an adjustment in the Contract Amount as approved by the Architect and the Owner.

- ###### C.
- Applicable reference standards include, but are not necessarily limited to, standards of agencies and associations who may be referred to in the Specifications by the following abbreviations.

- |             |   |   |
|-------------|---|---|
| 1. "AA"     | = | Aluminum Association  |
| 2. "AABC"   | = | Associated Air Balance Council                                |
| 3. "AAMA"   | = | American Architectural Manufacturers' Association             |
| 4. "AASHTO" | = | American Assoc. of State Highway and Transportation Officials |
| 5. "ACI"    | = | American Concrete Institute                                   |

6.	"ADC"	=	Air Diffusion Council
7.	"AGC"	=	Associated General Contractors of America
8.	"AI"	=	Asphalt Institute
9.	"AIA"	=	American Institute of Architects
10.	"AISC"	=	American Institute of Steel Construction, Inc.
11.	"AISE"	=	Association of Iron and Steel Engineers
12.	"AISI"	=	American Iron and Steel Institute
13.	"AITC"	=	American Institute of Timber Construction
14.	"ANSI"	=	American National Standards Institute
15.	"APA"	=	American Plywood Association
16.	"API"	=	American Petroleum Institute
17.	"ARI"	=	Air Cond. and Refrigeration Institute
18.	"ASCE"	=	American Society of Civil Engineers
19.	"ASHRAE"	=	American Institute of Heating, Refrigerating, and Air Conditioning Engineers
20.	"ASME"	=	American Society of Mechanical Engineers
21.	"ASTM"	=	American Society for Testing and Materials
22.	"AWI"	=	Architectural Woodwork Institute
23.	"AWS"	=	American Welding Society
24.	"AWWA"	=	American Water Works Association
25.	"BIA"	=	Brick Institute of America
26.	"BOCA"	=	Building Officials and Code Administrators, International
27.	"CDA"	=	Copper Development Association
28.	"CRSI"	=	Concrete Reinforcing Steel Institute
29.	"CS"	=	"Commercial Standards" of the U. S. Department of Commerce Office of Industry and Commerce Commodity Standards Division
30.	"CSA/CAN"	=	Canadian Standards Association
31.	"DOE"	=	United States Department of Energy
32.	"DOT"	=	United States Department of Transportation
33.	"FGMA"	=	Flat Glass Marketing Association
34.	"NEMA"	=	National Electrical Manufacturers' Assoc.
35.	"NFPA"	=	National Fire Protection Association
36.	"PCI"	=	Precast/Prestressed Concrete Institute
37.	"SMACNA"	=	Sheet Metal and Air Conditioning Contractors' National Association
38.	"SSPC"	=	Steel Structures Painting Council
39.	"TCA"	=	Tile Council of America, Inc.
40.	"UL"	=	Underwriters Laboratory

#### END OF SECTION

## **SECTION 01 53 00**

### **TEMPORARY CONSTRUCTION**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Temporary telephone and facsimile service.
- B. Temporary Controls: Barriers, enclosures, and fencing.
- C. Security requirements.
- D. Vehicular access and parking.
- E. Project identification sign.
- F. Field offices.

##### **1.02 RELATED SECTIONS**

- A. Section 01525 - Field Offices.
- B. Section 01550 - Vehicular Access and Parking.
- C. Section 01565 - Security Measures.
- D. Section 01585 - Project Signs.

##### **1.03 TEMPORARY UTILITIES – NOT USED**

##### **1.04 TEMPORARY SANITARY FACILITIES – Not Used**

##### **1.05 BARRIERS**

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

##### **1.06 FENCING**

- A. Construction: Contractor's option.
- B. Construction: Commercial grade chain link fence.
- C. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

##### **1.07 EXTERIOR ENCLOSURES**

- A. Contractor to provide barricades and temporary construction in order to provide access to the building during work on the exterior improvements of the building.

##### **1.08 SECURITY - See Section 01 53 00**

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

#### **1.09 VEHICULAR ACCESS AND PARKING -**

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. For contractor's parking, see -----
- C. Do not allow vehicle parking on existing pavement.

#### **1.10 WASTE REMOVAL**

- A. See Section 01 74 00 – Cleaning and Waste Management, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

#### **1.11 PROJECT SIGNS -**

#### **1.12 PROJECT IDENTIFICATION**

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

#### **1.13 FIELD OFFICES –**

#### **1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Restore existing facilities used during construction to original condition.
- B. Restore new permanent facilities used during construction to specified condition.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**



## **SECTION 01 65 00**

### **PRODUCT STORAGE AND HANDLING REQUIREMENTS**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
  - 2. Additional procedures also may be prescribed in other Sections of these Specifications.

##### **1.02 QUALITY ASSURANCE**

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

##### **1.03 MANUFACTURERS' RECOMMENDATIONS**

- A. Except as otherwise approved by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

##### **1.04 PACKAGING**

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
  - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

##### **1.05 PROTECTION**

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

##### **1.06 REPAIRS AND REPLACEMENTS**

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

**END OF SECTION**

## **SECTION 01 70 00**

### **EXECUTION AND CLOSEOUT REQUIREMENTS**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, except payment procedures.

##### **1.02 RELATED SECTIONS**

- A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 33 32 - Submittal and Substitutions: Submittals procedures.
- C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 53 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 53 00 - Temporary Facilities and Controls: Temporary interior partitions.
- F. Section 01 53 00 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
- G. Section 01 74 00 - Waste Management: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- H. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- I. Section 02 41 13 - Selective Site Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- J. Individual Product Specification Sections:
  - 1. Advance notification to other sections of openings required in work of those sections.
  - 2. Limitations on cutting structural members.

##### **1.03 SUBMITTALS**

- A. See Section 01 33 23 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
  - 1. On request, submit documentation verifying accuracy of survey work.
  - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
  - 3. Submit surveys and survey logs for the project record.

- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
  - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
  - 2. Identify demolition firm and submit qualifications.
  - 3. Include a summary of safety procedures.
- D. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.
  - 6. Include in request:
    - a. Identification of Project.
    - b. Location and description of affected work.
    - c. Necessity for cutting or alteration.
    - d. Description of proposed work and products to be used.
    - e. Alternatives to cutting and patching.
    - f. Effect on work of Owner or separate Contractor.
    - g. Written permission of affected separate Contractor.
    - h. Date and time work will be executed.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities.

#### **1.04 QUALIFICATIONS**

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For survey work, employ a land surveyor registered in Project Location and acceptable to Design Professional. Submit evidence of Surveyor's Errors and Omissions Insurance coverage in the form of an Insurance Certificate.
- C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Project Location.

#### **1.05 PROJECT CONDITIONS**

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
  - 1. Minimize amount of bare soil exposed at one time.
  - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
  - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
  - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- G. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

## **1.06 COORDINATION**

- A. See Section 01 10 00 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## **PART 2 PRODUCTS**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 33 23.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.

- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.02 PREPARATION**

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

### **3.03 PREINSTALLATION MEETINGS**

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

### **3.04 LAYING OUT THE WORK—Not Used**

### **3.05 GENERAL INSTALLATION REQUIREMENTS**

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

### **3.06 CUTTING AND PATCHING**

- A. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

- C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- E. Restore work with new products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of the penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- I. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- J. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

### **3.07 PROGRESS CLEANING**

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

### **3.08 PROTECTION OF INSTALLED WORK**

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

### **3.09 STARTING SYSTEMS**

- A. Coordinate schedule for start-up of various equipment and systems.

- B. Notify Design Professional and owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### **3.10 DEMONSTRATION AND INSTRUCTION**

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

### **3.11 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 15950 and 01400.

### **3.12 FINAL CLEANING**

- A. Owner will provide comprehensive cleaning after final acceptance.
- B. Execute final cleaning prior to final project assessment.
  - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- C. Use cleaning materials that are nonhazardous.
- D. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- F. Clean filters of operating equipment.
- G. Clean debris from roofs, gutters, downspouts, and drainage systems.

- H. Clean site; sweep paved areas, rake clean landscaped surfaces.
- I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- J. Clean Owner-occupied areas of work.

**END OF SECTION**



**SECTION 01 71 23**  
**FIELD ENGINEERING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Provide such field engineering services as are required for proper completion of the Work including, but not necessarily limited to:
  - 1. Establishing and maintaining lines and levels;
  - 2. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.

**1.02 SUBMITTALS**

- A. Comply with pertinent provisions of Section 01 33 23.
- B. Upon request of the Architect, submit:
  - 1. Data demonstrating qualifications of persons proposed to be engaged for field engineering services.
  - 2. Documentation verifying accuracy of field engineering work.
  - 3. Certification, signed by the Contractor's retained field engineer, certifying that elevations and locations of improvements are in conformance or nonconformance with requirements of the Contract Documents.

**1.03 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

**1.04 PROCEDURES**

- A. In addition to procedures directed by the Contractor for proper performance of the Contractor's responsibilities:
  - 1. Locate and protect control points before starting work on the site.
  - 2. Preserve permanent reference points during progress of the Work.
  - 3. Do not change or relocate reference points or items of the Work without specific approval from the Architect.
  - 4. Promptly advise the Architect when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.
    - a. Upon direction of the Architect, require the field engineer to replace reference stakes or markers.
    - b. Locate such replacements according to the original survey control.

**END OF SECTION**

## SECTION 01 74 00

### CLEANING AND WASTE MANAGEMENT

#### PART 1 GENERAL

##### 1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Owner may decide to pay for additional recycling, salvage, and/or reuse based on Landfill Alternatives Proposal specified below.
- E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
  - 1. Aluminum and plastic beverage containers.
  - 2. Corrugated cardboard.
  - 3. Wood pallets.
  - 4. Clean dimensional wood: May be used as blocking or furring.
  - 5. Land clearing debris, including brush, branches, logs, and stumps: See Section 02230 for use options.
  - 6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
  - 7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
  - 8. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
  - 9. Precast concrete panels: May be used for erosion control or landscape features.
  - 10. Asphalt paving: May be recycled into paving for project.
  - 11. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
  - 12. Glass.
  - 13. Gypsum drywall and plaster.
  - 14. Plastic buckets.
  - 15. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (<http://flooring.dupont.com>) and Interface ([www.interfaceinc.com](http://www.interfaceinc.com)) conduct reclamation programs.
  - 16. Asphalt roofing shingles.
  - 17. Paint.
  - 18. Plastic sheeting.
  - 19. Rigid foam insulation.
  - 20. Vinyl siding.
  - 21. Windows, doors, and door hardware.
  - 22. Plumbing fixtures.
  - 23. Mechanical and electrical equipment.
  - 24. Fluorescent lamps (light bulbs).
  - 25. Acoustical ceiling tile and panels.
- F. Owner has authorized a waste-management firm to deal with waste generated from this project. The contractor shall contract with selected firm for bins' provisions and disposal. Subject firm will manage all recyclable materials.

G. Methods of trash/waste disposal that are not acceptable are:

1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other illegal dumping or burying.
5. Incineration, either on- or off-site.

H. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, State and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

## 1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary: List of items to be salvaged from the existing building for relocation in project or for Owner.
- B. Section 01 31 19 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- C. Section 01 53 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- D. Section 01 65 00 - Storage and Protection: Waste prevention requirements related to delivery, storage, and handling.
- E. Section 01 70 00 - Execution Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

## 1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

#### **1.04 SUBMITTALS**

- A. See Section 01 33 23 – Submittal and Substitutions, for submittal procedures.
- B. Once Owner has determined which of the landfill alternatives addressed in the Proposal above are acceptable, prepare and submit Waste Management Plan; submit within 10 calendar days after notification by Design Professional.
- C. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.
- D. Waste Management Plan: Include the following information:
  - 1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
  - 2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
  - 3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
    - a. List each material proposed to be salvaged, reused, or recycled.
    - b. List the local market for each material.
    - c. State the estimated net cost, versus landfill disposal.
  - 4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
  - 5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
  - 6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
  - 7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.
- E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
  - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
  - 2. Submit Report on a form acceptable to Owner.
  - 3. Landfill Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
    - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

4. Incinerator Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
    - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
  5. Recycled and Salvaged Materials: Include the following information for each:
    - a. Identification of material, including those retrieved by installer for use on other projects.
    - b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.
    - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
    - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
  6. Material Reused on Project: Include the following information for each:
    - a. Identification of material and how it was used in the project.
    - b. Amount, in tons or cubic yards (cubic meters).
    - c. Include weight tickets as evidence of quantity.
  7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.
- F. Recycling Incentive Programs:
1. Where revenue accrues to Contractor, submit copies of documentation required to qualify for incentive.
  2. Where revenue accrues to Owner, submit any additional documentation required by Owner in addition to information provided in periodic Waste Disposal Report.

## **PART 2 PRODUCTS**

### **2.01 PRODUCT SUBSTITUTIONS**

- A. See Section 01 33 23 – Submittal and Substitutions for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 33 23:
  1. Relative amount of waste produced, compared to specified product.
  2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
  3. Proposed disposal method for waste product.
  4. Markets for recycled waste product.

## **PART 3 EXECUTION**

### **3.01 WASTE MANAGEMENT PROCEDURES**

- A. See Section 01 10 00 for list of items to be salvaged from the existing building for relocation in project or for Owner.
- B. See Section 01 31 19 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- C. See Section 01 74 00 for additional requirements related to trash/waste collection and removal facilities and services.

- D. See Section 01 74 00 for waste prevention requirements related to delivery, storage, and handling.
- E. See Section 01 74 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

### **3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION**

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Design Professional.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
  - 1. Pre-bid meeting.
  - 2. Pre-construction meeting.
  - 3. Regular job-site meetings.
  - 4. Job safety meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
  - 1. As a minimum, provide:
    - a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
    - b. Separate dumpsters for each category of recyclable.
    - c. Recycling bins at worker lunch area.
  - 2. Provide containers as required.
  - 3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
  - 4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
  - 5. Locate enclosures out of the way of construction traffic.
  - 6. Provide adequate space for pick-up and delivery and convenience to subcontractors.
  - 7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
  - 8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

### **END OF SECTION**

## **SECTION 01 78 00**

### **CLOSEOUT SUBMITTALS**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

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

##### **1.02 RELATED SECTIONS**

- A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 33 23 - Submittals and Substitutions: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 - Execution Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

##### **1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Design Professional with claim for final Application for Payment.
- B. Operation and Maintenance Data:
  - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Design Professional will review draft and return one copy with comments.
  - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
  - 3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Design Professional comments. Revise content of all document sets as required prior to final submission.
  - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
  - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION**

##### **3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.

4. Change Orders and other modifications to the Contract.
  5. Reviewed shop drawings, product data, and samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Conversion of schematic layouts:
1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
    - a. Final physical arrangement is determined by the Contractor, subject to the Architect's approval.
    - b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items that are shown only schematically on the Drawings.
- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- G. Final project record documents.
1. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
  2. Approval of recorded data prior to transfer:
    - a. Following receipt of the electronic file (CADD – latest version), and prior to start of transfer of recorded data thereto, secure the Architect's approval of all recorded data.
    - b. Make required revisions.
  3. Transfer of data to Drawings:
    - a. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.
    - b. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction, and the actual location of items in 3.01-C above.
    - d. Call attention to each entry by drawing a "cloud" around the area or areas affected.
    - d. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.
  4. Transfer of data to other Documents:
    - a. If the Documents other than Drawings have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the Architect, the job set of these Documents other than Drawings will be accepted as final Record Documents.
    - b. If any such Document is not so approved by the Architect, secure a new copy of that Document from the Architect at the Architect's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the Architect.
  5. Review and submittal:
    - a. Submit the completed set of Project Record Documents to the Architect.
    - b. Participate in review meetings as required.
    - c. make required changes and promptly deliver the final Project Record Documents to the Architect.
- H. Changes subsequent to acceptance:
1. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.



### **3.02 OPERATION AND MAINTENANCE DATA**

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

### **3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

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

### **3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

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

- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports.
- O. Additional Requirements: As specified in individual product specification sections.

### **3.05 OPERATION AND MAINTENANCE MANUALS**

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Binders: Commercial quality, 8-1/2 x 11 inch (216 x 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Design Professional, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - 3. Part 3: Project documents and certificates, including the following:
    - a. Shop drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Photocopies of warranties and bonds.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Design Professional, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

### **3.06 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- F. Manual: Bind in commercial quality 8-1/2 x 11 inch (216 x 279 mm) three D side ring binders with durable plastic covers.
- G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

**END OF SECTION**

**SECTION 01 78 36**  
**WARRANTIES AND BONDS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES:**

- A. Summary
- B. Form of Warranty
- C. Submittal Requirements
- D. Form of Submittal
- E. Time of Submittals
- F. Submittals Required

**1.02 RELATED REQUIREMENTS:**

Section 01 78 00 - Closeout Submittals  
Sections 02000 through 16000

**1.03 INCLUDED:**

- A. Summary
  - 1. Warranties between Contractor and manufacturers and between Contractor and suppliers shall not affect warranties between Contractor and the Owner.
  - 2. In addition to other requirements specified:
    - a. Compile specified service and maintenance contracts.
    - b. Co-execute submittals when so specified.
    - c. Review submittals to verify compliance with Contract Documents.
    - d. Submit to the Architect for review and transmittal to the Owner.
- B. Form of Warranty
  - 1. Submit two (2) originals of the warranty form provided as Attachment "A", typed on the Contractor's letterhead, for the entire Work or special warranties, typed on Subcontractor's letterhead and notarized, when required by a Specification Section. All work in place shall be guaranteed, at a minimum for one (1) year after date of Substantial Completion.
- C. Submittal Requirements
  - 1. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and Contractors.
  - 2. Number of Original Signed Copies Required: Two (2) each.
  - 3. Table of Contents: Neatly typed; in orderly sequence. Provide complete information for each item; include:
    - a. Product or work item.
    - b. Firm (Subcontractor or supplier) name with name of principal, address, and telephone number.
    - c. Scope of work or service covered.

- d. Date of beginning of warranty, bond, or service and maintenance contract.]
- e. Duration of warranty, bond, or service and maintenance contract.
- f. Provide the following information for the Owner.
  - (1) Proper procedure in case of failure.
  - (2) Circumstances which might affect the validity of warranty or bond.
- g. Contractors' name, name of responsible principal, address, and telephone number.

**D. Form of Submittal**

- 1. Prepare in duplicate packets: four (4) complete Submittals; two (2) originals and two (2) copies.
- 2. Format:
  - a. Size: 8 ½" x 11" sheets punched for three-ring binder. Fold larger sheets to fit into binders.
  - b. Cover: Identify each packet with typed or printed title, "WARRANTIES AND BONDS." List:
    - (1) Title of Project.
    - (2) Name of Contractor.
- 3. Binders: Commercial quality three-ring, with durable and cleanable plastic covers.

**E. Time of Submittals**

- 1. Within thirty (30) days after date of Substantial Completion, prior to final request for payment.
- 2. For items of work, where acceptance is delayed more than thirty (30) days beyond the date of Substantial Completion, provide updated submittal within ten (10) days after Final Completion, listing the date of Final Completion as the start of the warranty period.

**F. Submittals Required**

- 1. Submit special warranties, bonds, and service and maintenance contracts specified in the individual Sections.

**SECTION 01 78 36  
ATTACHMENT "A"**  
**(SAMPLE FORM OF WARRANTY - SUBMIT ON CONTRACTOR/SUBCONTRACTOR LETTERHEAD)**

**CITY OF BEVERLY HILLS - FIRE STATION NO. 2 REMODEL**

**WRITTEN WARRANTY  
FOR** \_\_\_\_\_

(Entire work, in the case of the Contractor, or a specific Specification Section, in the case of a Subcontractor.)

**We hereby warrant**

\_\_\_\_\_  
(Description of work, equipment, product, etc.)

**Which we have provided in**

\_\_\_\_\_  
(Description of location:)

**has been completed in accordance with the Specification Section stated above and the Contract Documents requirements and is hereby warranted for a period of**

\_\_\_\_\_  
(Indicate overall duration)

**commencing on** \_\_\_\_\_ **and ending on** \_\_\_\_\_  
(Start date) (End date)

We agree to repair or replace any or all of our Work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or materials within the period of time prescribed by law or latently defective in its workmanship or materials within the period of time prescribed by law from date established in the Certificate of Substantial Completion of the above-named structure, ordinary wear and tear and unusual abuse or neglect excepted.

We also agree to repair any damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than fourteen (14) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefor upon demand.

**SIGNED** \_\_\_\_\_  
(Subcontractor's name, address, license number, and date of signing)

OR

**SIGNED** \_\_\_\_\_  
(Subcontractor's name, address, license number, and date of signing)

**COUNTERSIGNED** \_\_\_\_\_  
(Contractor's name, address, license number, and date of signing)

## SECTION 01 90 00

### SEISMIC BRACING AND ANCHORING

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Provide bracing and anchoring for all cabinets, casework, wall-hung and ceiling-hung equipment and specialties, floor-supported and floor-attached equipment, conveying systems, mechanical equipment, electrical equipment, and all other non-portable items essential to operation and use of the facility including items furnished by the Contractor and items furnished by the Owner but installed by the Contractor.
- B. For Owner-Furnished-Contractor-Installed items, the Owner will furnish such additional information as is required by the Contractor for preparation of Shop Drawings and calculations.

##### 1.02 SUBMITTALS

- A. Where design of bracing and anchoring is completely shown on the Drawings, no submittal is required.
- B. Where design of bracing and anchoring is not completely shown on the Drawings, and for equipment and/or items shown as "deferred," prepare and submit the following in accordance with the approved Contract Schedule:
  - 1. Shop Drawings clearly defining the proposed method for bracing and anchoring the pertinent item or items, and interface of the bracing and anchoring with adjacent materials;
  - 2. Calculations, prepared, signed, and stamped by a registered civil or structural engineer, employed and paid by the Contractor, supporting the proposed bracing and anchoring design and demonstrating its adequacy.
- C. Secure the Architect's approval and approval of all governmental agencies having jurisdiction prior to fabrication and installation.

##### 1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent requirements of governmental agencies having jurisdiction, brace and anchor to resist horizontal forces acting in any direction using the following criteria:
  - 1. Light fixtures 100% of weight;
  - 2. Fixed equipment 50% of operating weight;
  - 3. Emergency power and communication 75% of operating weight;
  - 4. Flexibly-mounted equipment Use two times the above values;
  - 5. Simultaneous vertical force Use 1/3 times the horizontal force.

#### PART 2 - PRODUCTS

##### 2.01 GENERAL

- A. Provide materials, equipment, labor, and all other items as needed to comply with requirements of the governmental agencies having jurisdiction.

## **PART 3 - EXECUTION**

### **3.01 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### **3.02 FABRICATION AND INSTALLATION**

- A. Fabricate and install bracing and anchoring in accordance with the approved design and all other requirements of the Contract.

**END OF SECTION**



**SECTION 020700  
SELECTIVE DEMOLITION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. In accordance with pertinent provisions of this Section, carefully demolish and remove from the site those items scheduled to be so demolished and removed.

Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

**1.2 QUALITY ASSURANCE**

- A Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- A Comply with pertinent provisions of Section 01 65 00.

**PART 2 - PRODUCTS**

(No products are required in this Section)

**PART 3 - EXECUTION**

**3.1 SURFACE CONDITIONS**

- A Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

**3.2 DEMOLITION**

- A By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.
- B. In company with the Architect, visit the site and verify the extent and location of selective demolition required.
1. Carefully identify limits of selective demolition.
  2. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.
- C. Prepare and follow an organized plan for demolition and removal of items.
1. Shut off, cap, re-route as shown or as required and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.

2. Review Hazardous Material Survey report, prior to demolition activities which would disturb ACMs and LCSs a licensed abatement removal contractor should remove the hazardous materials.
  3. Completely remove items scheduled to be so demolished and removed, leaving surfaces clean, solid, and ready to receive new materials specified elsewhere.
  4. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.
- D. Demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site.
- E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

### 3.3 REPLACEMENTS

- A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the approval of the Architect and at no additional cost to the Owner.

END OF SECTION

## **SECTION 05 54 00**

### **LIGHT GAGE METAL FRAMING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Work includes: "C" shaped steel framing components as indicated on the Drawings and specified herein.

##### **1.2 SUBMITTALS**

- A. Submit copies of manufacturer's product information and installation instructions for each item of framing and accessories.
- B. Submit large scale wall elevations, sections, details and shop drawings for all components
- C. Scrap collection and recycling plan: Contractor shall prepare and submit a scrap collection and recycling plan for all miscellaneous and structural steel.

##### **1.3 QUALITY ASSURANCE**

- A. Component Design: Compute structural properties of framing system components in accordance with AISI Specifications for the Design of Cold-Formed Steel Structural Members; and CBC.
- B. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units which have been approved.

##### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Protect metal framing units and components from rusting and damage. Deliver to project site in manufacturer's unopened containers or bundles fully identified with name, brand, type and grade.
- B. Store off ground in dry, ventilated space or protect with approved waterproof coverings.

#### **PART 2 - PRODUCTS**

##### **2.1 MANUFACTURER**

- A. Provide materials and products manufactured by one of the members of the Steel Framing Industry Association (SFIA) or Steel Stud Manufacturers' Association (SSMA)

##### **2.2 METAL FRAMING**

- A. System Components: With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories necessary for installation indicated.

- B. **Materials and Finishes:** Refer to Drawings for size, gage, and physical properties of metal studs.
1. For 16 gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 50,000 p.s.i.; ASTM A446 Grade D.
  2. For 18 gage and lighter units, fabricate metal framing components of commercial quality sheet steel with a minimum yield point of 33,000 p.s.i.; ASTM A653 SQ, A570, or A611.
  3. Provide galvanized finish to metal framing members and components complying with ASTM A525 for minimum G60 zinc coating.
  4. "C" Shape Studs: Provide manufacturer's standard load-bearing steel studs of size, shape, and gage required, with 1.625-inch flange and flange return lip.
  5. Steel Stud Track: Unpunched deep leg track, width and gage as indicated on the drawings.
  6. Steel Furring Channels: 2-inch, 1-1/2 inch and 3/4 inch cold rolled 16 gage, prime painted.
  7. Steel Bridging: "V" bridging, width as required by stud size, 16 gage.
  8. Mechanical Fasteners: Equal to Teks screws as indicated or noted on Drawing

## **2.3 FABRICATION**

- A. Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in manner to prevent damage and distortion in assembly members.
- B. Fastenings: Attach components by welding, bolting, or screw fasteners, as standard with manufacturer.
- C. Wire tying of framing components is not permitted.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Prior to start of installation, review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

### **3.2 INSTALLATION**

- A. Install framing systems in accordance with drawings, reviewed shop drawings, and manufacturer's recommendations.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks to layout at base and tops of studs. Provide fasteners at corners and ends of tracks. See drawings for details.

- C. Set studs plumb, except as needed for diagonal bracing.
- D. Where stud system abuts structural columns or walls, anchor ends of stiffeners to supporting structure.
- E. Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, heavy trim and furnishings, and similar work requiring attachment to wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering the weight, loading, and long term effects resulting from the items supported.
- F. Secure studs to top and bottom runner tracks by welding or screw attachment, fastening to both inside and outside flanges.
- G. Frame wall openings larger than 24 inches square with double stud at each jamb of frame except where more than two are shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jack studs with stud shoes or by welding, and space jack studs same as full height studs of wall. Secure stud system all around to wall opening frame in manner required.
- H. Provide horizontal blocking in stud system, spaced vertically at no more than 4 feet 6-inches, or as recommended by manufacturer whichever is more stringent. Weld at each intersection.

### **3.3 PROTECTION**

- A. Touch-up shop applied protective coatings damaged during handling, fabrication, or installation. Use compatible primer for prime coated surfaces; use galvanizing repair paint for galvanized surfaces.

**END OF SECTION**

**SECTION 06410**  
**CUSTOM CABINETS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Specially fabricated cabinet units.
- B. Cabinet hardware.
- C. Factory finishing.
- D. Preparation for installing utilities.

**1.02 RELATED SECTIONS**

- A. Section 06415 - Countertops.
- B. Section 06423 – Interior Wood Composite Panels
- C. Section 09900 - Paints and Coatings: Site finishing of cabinet exterior.

**1.03 REFERENCES**

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.
- B. ANSI A208.1 - American National Standard for Particleboard; 1999.
- C. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2002.
- D. AWII/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2006, 8th Ed., Version 2.0.
- E. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.9).
- F. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.
- G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2004 (ANSI/HPVA HP-1).
- H. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- I. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2003.
- J. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.
- K. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- L. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

#### **1.04 SUBMITTALS**

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish..

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.
- B. Perform cabinet construction in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.
- C. Perform cabinet construction in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated as follows:
  - 1. \_\_\_\_\_ Cabinets: Custom quality.
- D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- E. Manufacturer Qualifications: Member in good standing of the Architectural Woodwork Institute (AWI) or the Architectural Woodwork Manufacturers Association of Canada (AWMAC) and familiar with the AWI/AWMAC QSI.
- F. Quality Certification: Provide inspection and quality certification of completed custom cabinets in accordance with AWI/AWMAC Quality Certification Program.

#### **1.06 PRE-INSTALLATION MEETING**

- A. Convene not less than one week before starting work of this section.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Protect units from moisture damage.

#### **1.08 ENVIRONMENTAL REQUIREMENTS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Fabricate architectural woodwork to "custom grade" standards of the Woodwork Institute of California.
- B. Fabricate cabinets in flush overlay design with doors and drawers in reveal overlay design.
- C. At the mill, install the finish hardware.

## 2.02 PANEL MATERIALS

- A. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with interior grade adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings.
- B. Medium Density Fiberboard (MDF): ANSI A208.2; type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated; composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness as required.
  - 1. Use for painted components and concealed components.
  - 2. Use as backing for plastic laminate unless otherwise indicated.
- C. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch (6 mm) thick, smooth two sides (S2S); use for drawer bottoms, dust panels, and other components indicated on drawings.
- D. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

## 2.03 LAMINATE MATERIALS

- A. Manufacturers:
  - 1. Wilsonart International, Inc; [www.wilsonart.com](http://www.wilsonart.com).
  - 2. Formica Corporation; [www.formica.com](http://www.formica.com).
  - 3. Nevamar Company; [www.nevamar.com](http://www.nevamar.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:
  - 1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness, colors as scheduled, finish as scheduled.
  - 2. Post-Formed Horizontal Surfaces: HGP, 0.039 inch (1.0 mm) nominal thickness, colors as scheduled, finish as scheduled.
  - 3. Post-Formed Vertical Surfaces: VGP, 0.028 inch (0.71 mm) nominal thickness, colors as scheduled, finish as scheduled.
  - 4. Flame Retardant Surfaces: HGF, 0.048 inch (1.22 mm) nominal thickness, colors as scheduled, finish as scheduled.
  - 5. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness, colors as scheduled, finish as scheduled.
  - 6. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
  - 7. Thru core plastic laminate material where shown on the drawings.
  - 8. Metal Laminate where shown on the drawings
  - 9. Chemical resistant Plastic Laminates, where shown on the drawings

## 2.05 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application. Do not use "contact" adhesive.  
**Refer to Sheet A-0.4 for adhesive allowable VOC limits.**
- C. Plastic Edge Banding: heavy gauge (3 mm) Extruded PVC, flat face shaped; smooth finish; self-locking; of width to match component thickness, color as selected from manufacturer's standards.
  - 1. Use at all edges.



- D. Glass: Type A as specified in Section 08800.
- E. Fasteners: Size and type to suit application.
- F. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel, or chrome-plated finish in exposed locations.
- G. Concealed Joint Fasteners: Threaded steel.
- H. Grommets: Standard plastic cut-outs, in color to match adjacent surface.

## 2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
  - 1. Product: No. 239 manufactured by K-V.
- C. Adjustable Shelf Supports:
  - 1. Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
    - a. Product: No. 346 manufactured by K-V.
    - For 1" thick shelves, use heavy-duty shelf supports, 150-lb. capacity.**
  - 2. Earthquake proof Shelf Clip (at Lockers and bedrooms upper cabinets)
    - a. Engstrom
    - For 1" thick shelves, use heavy-duty shelf supports, 150-lb. capacity.**
- D. Drawer and Door Pulls: with matt finish.
  - 1. Product: Manufactured by Hafele.
    - a. Apparatus and lockers – 106.74.902
    - b. Other cabinets – 116.07.631
- E. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
  - 1. Product: 1E Series – Slabbed Mortise Cylinder (1E7E4RP3626) manufactured by Best.
- F. Catches: Magnetic.
  - 1. Product: 246.29.301 manufactured by Hafele.
- G. Drawer and Shelf Slides:
  - 1. Type: Standard extension.
  - 2. Static Load Capacity: Heavy duty.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self-closing/stay closed type.
- H. Hinges: European style concealed self-closing type, steel with polished finish.
  - 1. General unless noted otherwise in 'I'
    - Blum, Inc; Product No. 75M5580-125, Degree "Clip" Hinge: [www.blum.com](http://www.blum.com).
    - a. Substitutions: See Section 01600 - Product Requirements.
- I. Hinges: Heavy Duty Institutional
  - 1. Full Height cabinets at Bedrooms and full height pantry cabinets at Kitchen: RPC institutional hinge- standard five-knuckle hinge with Dull Chrome finish Conform to ANSI/BHMA 156.9-2003 grade 1 products. Wood work institute Approved.

EBB-2-26D-03  
270 Degree opening angle  
Drilled knuckle IDs and machine knuckle edges  
Non – removable knurled pin  
a. Substitutions: None

- J. Locker Grilles: US Aire  
Model 1320, Size: refer to Drawings  
Heavy Gauge steel Construction, smooth face  
Finish: powder coat – custom color

## **2.07 SHOP TREATMENT OF WOOD MATERIALS**

- A. Provide UL approved identification on fire retardant treated material.  
B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

## **2.08 SITE FINISHING MATERIALS**

- A. Stain, Shellac, Varnish and Finishing Materials: As specified in Section 09900.  
B. Finishing: Site finished as specified in Section 09900.

## **2.09 FABRICATION**

- A. Cabinet Style: Flush overlay.  
B. Cabinet Doors and Drawer Fronts: Flush style.  
C. Drawer Construction Technique: Dovetail joints. Provide slip Dovetail construction, well glued.  
1. Sides and back: 5/8" thick solid wood sides and back.  
2. Bottom: 3/8" thick of solid wood dadoes into sides and front..  
D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.  
E. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.  
F. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.  
G. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.  
1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.  
2. Cap exposed plastic laminate finish edges with material of same finish and pattern.  
H. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:  
1. Provide center matched panels at each elevation.  
2. Provide sequence matching across each elevation.  
3. Carry figure of cabinet fronts to toe kicks.  
I. Mechanically fasten back splash to countertops with steel brackets at 16 inches (400 mm) on center.  
J. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.  
K. Shop glaze glass materials using the Interior Dry method specified in Section 08800.

## **2.10 FACTORY FINISHING**

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, Nitrocellulose Lacquer, Transparent.
- E. Finish work in accordance with WIC Manual of Millwork, Section 5, System #1a - Nitrocellulose Lacquer.
- F. Seal, stain and varnish exposed to view surfaces. Brush apply only.
- G. Seal stain and varnish internal exposed to view and semi-concealed surfaces. Brush apply only.
- H. Seal internal surfaces of cabinets with one coat of shellac. Brush apply only.
- I. Prime paint surfaces in contact with cementitious materials.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

### **3.02 INSTALLATION**

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. Site glaze glass materials using the Interior Dry method specified in Section 08800.

### **3.03 ADJUSTING**

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

### **3.04 CLEANING**

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

## **SECTION 06 40 15**

### **COUNTERTOPS**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Countertops for architectural cabinetwork.
- B. Countertops for manufactured casework.
- C. Wall-hung counters and vanity tops.

##### **1.02 RELATED SECTIONS**

- A. Section 06410 - Custom Cabinets.

##### **1.03 REFERENCES**

- A. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
- B. ANSI A208.1 - American National Standard for Particleboard; 1999.
- C. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2002.
- D. ANSI Z124.3 - American National Standard for Plastic Lavatories; 2005.
- E. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.
- F. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2003.
- G. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- H. AWI/AWMAC (QSI) - Quality Standard Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2006, 8th Ed., Version 2.0.
- I. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2002)
- J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- K. PS 1 - Construction and Industrial Plywood; 1995.
- L. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

##### **1.04 SUBMITTALS**

- A. See Section 0133 23 - Submittals and Substitutions, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

- E. Verification Samples: For each finish product specified, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- G. Installation Instructions: Manufacturer's installation instructions and recommendations.
- H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

#### 1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- B. Installer Qualifications: Fabricator.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

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

#### 1.07 PROJECT CONDITIONS

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

### PART 2 PRODUCTS

#### 2.01 COUNTERTOP ASSEMBLIES

- A. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
  - 1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGP, for postforming, 0.039 inch (HGP, for postforming, 1.0 mm) nominal thickness.
    - a. Surface Burning Characteristics: Flame spread 200 (Class III), maximum, when tested in accordance with ASTM E 84.
    - b. NSF approved for food contact.
    - c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
    - d. Laminate Core Color: Same as decorative surface.
    - e. Finish: Matte or suede, gloss rating of 5 to 20.
    - f. Surface Color and Pattern: To be selected from manufacturer's standard line.
    - g. Manufacturers:
      - 1) Formica Corporation: [www.formica.com](http://www.formica.com).
      - 2) Nevamar Company: [www.nevamar.com](http://www.nevamar.com).
      - 3) Wilsonart International, Inc: [www.wilsonart.com](http://www.wilsonart.com).
      - 4) Substitutions: See Section 01600 - Product Requirements.
  - 2. Exposed Edge Treatment: Postformed laminate; front edge substrate built up to minimum 1-1/4 inch (32 mm) thick with raised radiused edge, integral coved backsplash with radiused top edge.
  - 3. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch (32 mm) thick; covered with matching laminate.
  - 4. Exposed Edge Treatment: Molded rubber edge with T-spline, same width as edge of top; color to be selected; 3/4 inch (19 mm) edge.
  - 5. Exposed Edge Treatment: Hardwood nosing as indicated on drawings, natural spar varnish finish; back and end splashes with square top covered with matching laminate.
  - 6. Back and End Splashes: Same material, same construction.
  - 7. Fabricate in accordance with AWI/AWMA Quality Standards Illustrated Premium Grade.

- B. Stone Countertops: Stone slabs bonded to substrate; use as large pieces as possible with inconspicuous adhesive joints.
  1. Stone: Cesar Stone Quartz Surface
  2. Color: To be selected.
  3. Stone Thickness: 3/4 inch, minimum.
  4. Surface Finish: Polished.
  5. Exposed Edge Treatment: Square profile stone, 1 inch (25 mm) thick, with 3/16 inch (5 mm) radius corner.
  6. Back and End Splashes: Same material, same thickness; for field attachment.
  7. Sealants: Per stone distributor's recommendation.
- C. Stainless Steel Countertops: ASTM A 666 Type 304 stainless steel sheet, 14-gauge thickness.
  1. Finish: 4 satin brushed finish.
  2. Edge and Backsplash Sink Details: As indicated on drawings.
  3. Exposed Edge Shape: Straight turndown with return; 1 1/2 inch (38 mm) high face; 1/2 inch return to face of case.
  4. Exposed Edge Shape: Bullnose with return; 5/8 inch (16mm) radius, return to face of case; reinforced with steel.
  5. Exposed Edge Shape in Sink Areas: Marine edge with return; edge raised 3/16 inch (5 mm); above counter with 45 degree transition, minimum 1 inch flat rim; 1 1/2 inch (38mm) high turndown; 1/2 inch (12mm) return to face of case; reinforced with steel.
  6. Back and End Splashes: Same material; welded 1/4 inch (6 mm); ground smooth, finish to match adjacent surfaces; radius coved joint to countertop; square top edge with 1 inch (25 mm) wide top surface and minimum 1/2 inch (12 mm) turndown.
  7. Splash Dimensions: 4 inch (100 mm); 6 inch (150 mm) by 1 inch (25 mm) thick, unless otherwise indicated. Comply with NSF standard radiused requirements.
  8. Splash Depth Where Faucets are Mounted in Splash: 2 inches (50 mm).
  9. Splash Height: See Drawings.
  10. Sinks: Same material, same thickness; flush welded to counter; bottom sloped to outlet; radiused interior corners; drain outlet located in back corner.
  11. Metal Top Construction: Metal tops shall be one-piece welded construction, including field joints. A full perimeter galvanized steel channel frame cross-braced will be secured at a spacing of not farther than 2'-6" (760 mm) on center. Fasten top with stud bolts or tack welds. If hat sections are used in lieu of channels, close ends.
  12. Structural Framing: Except as otherwise indicated, provide framing of minimum 1 inch (25 mm) pipe-size round pipe or tube members, with mitered and welded joints and gusset plates, ground smooth. Provide 14-gauge (2.0 mm) stainless steel tube for exposed framing, and galvanized steel pipe for concealed framing.
- D. Wood Butcher Block:
  1. Finish: Per manufacturers recommendation (Howard Products, Inc.)
  2. Exposed Edge Shape: Square profile, 1 1/2" thick, with 3/16 inch (5 mm) radius corner.
  3. Back and End Splashes: Same material, same thickness; for field attachment.

## 2.02 ACCESSORY MATERIALS

- A. Wood-Based Components:
  1. Wood fabricated from old growth timber is not permitted.
  2. Provide sustainably harvested wood, certified or labeled as specified in Section 01600.
  3. Provide wood harvested within a 500 mile (535 km) radius of the project site.
  4. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.
- B. Plywood for Supporting Substrate: PS 1 Exterior Type, AC veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.

- C. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf (20 kg/cu m) minimum density; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
- D. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
- E. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- F. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch (12 mm) by 1/2 inch (12 mm); color as selected.
- G. Joint Sealant: Mildew-resistant silicone sealant, white.

## **2.03 FABRICATION**

- A. Fabricate in accordance with standards governing fabrication quality that are specified in Section 06 40 00.
- B. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using best method recommended by manufacturer.
  - 2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
  - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- C. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
  - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
  - 2. Height: 4 inches (102 mm), unless otherwise indicated.
- D. Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- E. Stainless Steel: Fabricate tops up to 144 inches (3657 mm) long in one piece including nosings and back and end splashes; accurately fitted mechanical field joints in lengths over that dimension are permitted.
  - 1. Weld joints; grind smooth and polish to match.
  - 2. Provide stainless steel hat channel stiffeners, welded or soldered to underside, where indicated on drawings.
  - 3. Provide wall clips for support of back/end splash turndowns.
  - 4. Sound Deadening: Apply water resistant, fire resistant sound deadening mastic to entire bottom surface.
- F. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

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

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).
- C. Attach wood countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).
- D. Install tile as specified in Section 09 30 13.
- E. Attach stainless steel countertops using stainless steel fasteners and clips.
- F. Attach epoxy resin countertops using compatible adhesive.
- G. Seal joint between back/end splashes and vertical surfaces.
  - 1. Where indicated use rubber cove molding.
  - 2. Where applied cove molding is not indicated use specified sealant.

### **3.04 CLEANING AND PROTECTION**

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

**END OF SECTION**



## **SECTION 07 21 00**

### **BUILDING INSULATION**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. Provide building insulation where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

##### **1.02 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

##### **1.03 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 65 00.

#### **PART 2 - PRODUCTS**

##### **2.01 MATERIALS**

- A. Provide the following building insulation where shown on the Drawings or otherwise needed to achieve the degree of insulation required under pertinent regulations of governmental agencies having jurisdiction.
  - 1. Type A: 3" thermal fiber insulation at wall type G.
  - 2. Type B: Unfaced glass fiber sound isolating batts, thickness to suit framing member 3 1/2" and 6".

##### **2.02 OTHER MATERIALS**

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## **PART 3 - EXECUTION**

### **3.01 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Remove, or protect against, projections in construction framing which may damage or prevent proper insulation.

### **3.02 INSTALLATION**

- A. Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position.

**END OF SECTION**

## **SECTION 07 60 00**

### **FLASHING AND SHEET METAL**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. Provide flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

##### **1.02 SUBMITTALS**

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
  - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

##### **1.03 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air-conditioning Contractors National Association (SMACNA).
- C. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standards specified.

##### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01620.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS AND GAGES**

- A. Where sheet metal is required, and no material or gage is indicated on the Drawings, provide the highest quality and gage commensurate with the referenced standards, but no less than 24 gage.

### **2.02 GALVANIZED IRON**

- A. Provide sheet metal or sheet iron of a standard brand of open-hearth copper-bearing steel, copper-molybdenum iron, or pure iron sheets.
- B. Zinc coating:
  - 1. Where galvanizing is required, provide zinc coating by hot-dip galvanize to all surfaces.
  - 2. Weight:
    - a. Provide not less than 1-1/4 oz per sq ft, nor more than 1-1/2 oz per sq ft, to surfaces required to be galvanized.
  - 3. Comply with ASTM A123-84.
  - 4. Separation of materials:
    - a. Sheets or surfaces of different materials, subject to electrolysis shall be thoroughly insulated. Where not otherwise furnished or provided for, the work of this section includes furnishing and installing of a heavy bodied bituminous paint, or non-abrasive tape or gasket, as a separation against galvanic or corrosive action.
  - 5. Where galvanizing is cut or damaged, touch up with Galvaloy or equal.

### **2.03 NAILS, RIVETS, AND FASTENERS**

- A. Use only soft iron rivets having rust-resistive coating, galvanized nails, and cadmium plated screws and washers in connection with galvanized iron and steel.

### **2.04 FLUX**

- A. Where flux is required, use raw muriatic acid.

### **2.05 SOLDER**

- A. Where solder is required, comply with ASTM B32.

### **2.06 OTHER MATERIALS**

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## **PART 3 - EXECUTION**

### **3.01 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### **3.02 WORKMANSHIP**

#### **A. General:**

1. Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
2. Unless otherwise specifically permitted by the Architect, turn exposed edges back 1/2".

#### **B. Form, fabricate, and install sheet metal so as to adequately provide for expansion and contraction in the finished Work.**

#### **C. Weatherproofing:**

1. Finish watertight and weather-tight where so required.
2. Make lock seam work flat and true to line, sweating full of solder.
3. Make lock seams and lap seams, when soldered, at least 1/2" wide.
4. Where lap seams are not soldered, lap according to pitch, but in no case less than 3".
5. Make flat and lap seams in the direction of flow.

#### **D. Joints:**

1. Join parts with rivets or sheet metal screws where necessary for strength and stiffness.
2. Provide suitable watertight expansion joints for runs of more than 40'-0", except where closer spacing is indicated on the Drawings or required for proper installation.

#### **E. Nailing:**

1. Whenever possible, secure metal by means of clips or cleats, without nailing through the exterior metal.
2. In general, space nails, rivets, and screws not more than 8" apart and, where exposed to the weather, use lead washers.
3. For nailing into wood, use barbed roofing nails 1-1/4" long by 11 gage.
4. For nailing into concrete, use drilled plugholes and plugs.

### **3.03 EMBEDMENT**

- A. Embed metal in connection with roofs in a solid bed of sealant, using materials and methods described in Section 07920 of these Specifications or other materials and methods approved in advance by the Architect.

### **3.04 SOLDERING**

#### **A. General:**

1. Thoroughly clean and tin the joint materials prior to soldering.
2. Perform soldering slowly, with a well heated copper, in order to heat the seams thoroughly and to completely fill them with solder.
3. Perform soldering with a heavy soldering copper of blunt design, properly tinned for use.
4. Make exposed soldering on finished surfaces neat, full flowing, and smooth.

- B. After soldering, thoroughly wash acid flux with a soda solution.

### **3.05 TESTS**

- A. Upon request of the Architect, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

**END OF SECTION**

## **SECTION 07 92 00**

### **JOINT SEALANTS**

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. Furnish all labor, materials, services, equipment and appliances required to perform all sealants and caulking, backing materials and supplementary work to complete the Contract including, but are not limited to, these major items:
  - 1. At all doors, windows, etc.
  - 2. At perimeter of all change in finish materials, i.e. between EIFS and metal flashings and/or concrete.
  - 3. Roof penetrations not specified under Mechanical or Electrical Sections.
  - 4. All concrete construction and separation joints in concrete building slab and site concrete.
  - 5. Sealant between storm drainage downspouts and wall outlets.
  - 6. Fire retardant sealants for type of rated penetration, as required.
  - 7. All other Sealants and Caulking as indicated on Drawings.

##### **1.02 RELATED WORK IN OTHER SECTIONS**

- A. Section 08 11 00: Steel Doors and Frames
- B. Section 08410: Aluminum Window Wall and Storefront
- C. Section 08 81 00: Glazing

##### **1.03 REFERENCE STANDARDS**

- A. ASTM C 920 Specification for Elastomeric Joint Sealants. A sealant qualifying under this specification shall be classified as to type, grade, class, and use as follows:
  - 1. Type S - Single component sealant
  - 2. Type M - Multi component sealant
  - 3. Grade P - Pourable or self-leveling
  - 4. Grade NS - Nonsag or gunable
  - 5. Class 25 - Adhesion and cohesion under movement shall withstand an increase or decrease of at least 25% of the joint width.
  - 6. Use T - Pedestrian and vehicular traffic areas. Sealant shall have a hardness reading, after being properly cured, of not less than 25 or more than 50 when tested in accordance with Test Method C 661.
  - 7. Use NT - Nontraffic applications
  - 8. Use M - Mortar/Masonry
  - 9. Use G - Glass
  - 10. Use A - Aluminum
  - 11. Use O - Other than the Standard Substrates meeting this specification.

ASTM C962 Standard Guide Use of Elastomeric Joint Sealants  
ASTM C1193 Standard Guide for Use of Joint Sealants.  
ASTM C1184 Standard Guide for Use of Structural Sealants.  
ASTM D1565 Standard Specification for Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell form)  
ASTM D1667 Standard Specification for Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam)

- B. Federal Specification:  
FS TT-S-00227E, "Sealing Compound, Rubber Base, Two-Component."

FS TT-S-00230, "Sealing Compounds, Synthetic Rubber Base, Single Component, Chemically Curing.

- C. Sealant, Waterproofing and Restoration Institute ( SWRI ) - Sealant and Caulking Guide Specifications.

#### **1.04 SUBMITTALS**

- A. Provisions: Comply with Section 01 33 23.
- B. Product Data: Submit manufacturer's technical data, mixing instructions, application recommendations and installation instructions, including cleaning and priming instructions and sealant limitations for each type of material required. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material selected complies or is suitable for the temperatures, movements and weather conditions that will be encountered during the sealants service life.
- C. Samples: Submit manufacturer's standard bead samples consisting of strips of actual products to be exposed to view showing full range of cured colors available.
- D. Contractor's and manufacturers' guarantees and warranties respectively.
- E. Sealant Schedule: Indicate each sealant type and backer rod type proposed for each appropriate location and for each appropriate substrate.
- F. Certificates: Furnish manufacturers certification that sealant systems comply with local regulations controlling use of volatile organic compounds. Manufacturer shall certify that sealant systems are compatible with adjacent substrate and related finish materials.
- G. Product Testing: Include manufacturer or independent laboratory test results demonstrating hardness, stain resistance, adhesion and cohesion under cyclic movement per ASTM C719, low temperature flexibility, modulus of elasticity at 100 percent strain, effects of heat aging and effects of accelerated weathering.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an installer who has successfully completed within the last three (3) years at least three (3) joint sealer applications similar to type and size to that of this project.
- B. Single Source for Materials: Obtain joint sealer materials from a single manufacturer for each different product required, for each different application.
- C. Manufacturer's representative to provide inspection of conditions prior to start of the work and initial supervision at the start of each application, to insure that any physical conditions which would result in defective work are properly corrected before materials are applied, and that proper procedure are being followed. Provide such inspection and supervision by qualified personnel. Report all unsatisfactory conditions existing at the time of inspection in writing to the Architect for correction before proceeding with the work.
- D. Notify the manufacturer's representative at least 72 hours prior to the time inspection is required.
- E. Failure or refusal of the manufacturer or manufacturer's representative to provide the inspection and supervision as required hereunder constitutes grounds for non-acceptability of materials manufactured, even though such materials have been specified or approved.

#### **1.06 REQUIREMENTS**

- A. Sealant system shall include joint preparation, joint back-up or bondbreaker, priming, sealant and caulking required to seal exterior and interior joints throughout the project, including those not specifically indicated in the Contract Documents, but necessary to completely eliminate active, direct and indirect moisture and weather elements of water, air or dust, from entering through, around, over and under joints of building components, to provide a watertight, moisture-tight and weathertight building envelope and seal joints between adjacent materials.
- B. Sealants are not to harden or soften more than 10 Shore A durometer points as measured 21 days after original installation.
- C. Verify compatibility of sealants with various other sealants or joint systems at any point of interface or possible contact.

#### **1.07 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to project site in original unopened containers or bundles with labels, indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store at 80°F or less in a cool, dry area. Handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes.
- C. Use sealant within the time recommended by the manufacturer.

#### **1.08 PROJECT/SITE CONDITIONS**

- A. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions, or when ambient and substrate temperatures are below or above manufacturer's recommended limitations for installation or below 40°F. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.
- B. Surface Conditions: Provide proper primers suited to conditions. Primers may be omitted upon certification by sealant manufacturer that they are not required. Where any doubt exists, prepare sample joints on actual materials as furnished for the job to determine the matter.

#### **1.09 WARRANTY**

Contractor shall submit manufacturer's written five (5) year warranty agreeing to replace joint sealers which fail or deteriorate including color resistance compromising system life.

#### **1.10 GUARANTEE**

Provide joint installer/manufacturer guarantee of work against inherent or developed defects in material or installation, agreeing to repair or replace joint sealers which fail, leak, crumble, harden, shrink, bleed, sag, stain or loose adhesion. Guarantee installed work to remain watertight for a period of two (2) years.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

Use sealants of the following types and manufacturers. Use manufacturer's standard or custom colored materials to match color of adjacent surfaces. Where adjacent materials on each side of the joint are different colors, the Architect will select sealant colors. If the desired color is not available from one manufacturer, select the proper color from another manufacturer.



## 2.02 MANUFACTURERS

- A. Provide one of the following for each different product required:
1. Momenive Performance Material
  2. Mameco/International, Inc.
  3. Pacific Polymers
  4. Pecora
  5. Sika
  6. Equivalent products meeting performance criteria specified will be acceptable.

## 2.03 MATERIAL TYPES

### A. POLYURETHANE SEALANTS

1. One part, non sag, non staining, gun grade sealants ASTM C920, Type S, Grade NS, Class 25, uses NT, M, G, A & O, TT-S-00230C, Type II, Class A.
  - a. Location/Use: Exterior/Interior, Horizontal/Vertical joints in concrete, masonry, steel, aluminum and glass
  - b. Mameco International 'Vulkem 116 or 921'  
Pacific Polymers 'Elasto-thane 230-Type II', Elasto-seal 230  
Pecora 'Dynatrol 1'  
Sika - Sikaflex - 1a or 15LM  
Sonneborn 'Sonolastic NP-1/Ultra/Sonolastic 150
2. Two part, non sag, non staining, gun grade sealant, Type M, Grade NS, Class 25, uses NT, M, A & O, TT-S-00227E, Type II, Class A.
  - a. Location/Use: Exterior/Interior, Horizontal/Vertical joints in concrete, masonry, steel, aluminum.
  - b. Mameco International 'Vulkem 227 or 922'  
Pacific Polymers 'Elasto-seal 227 or Elasto-thane 920 Type II'  
Pecora 'Dynatrol II'  
Sika - Sikaflex - 2c NS/SL  
Sonneborn 'Sonolastic NP-2'
3. One part, self leveling, pourable sealant, ASTM C920, Type S, Grade P, Class 25, Uses T, M, A & O, TT-S-00230C, Type I
  - a. Location/Use: Exterior/Interior, Horizontal expansion and control joints; light traffic.
  - b. Mameco International 'Vulkem 45'  
Pecora 'Urexpan NR-201'  
Sika - Sikaflex - 1 CSL  
Sonneborn 'Sonolastic SL1'
4. Two part, self leveling, pourable sealant, ASTM C920, Type M, Grade P, Class 25, uses T, M, A & O, TT-S-00227E, Type I.
  - a. Location/Use: Exterior/Interior, Horizontal expansion and control joints; medium to heavy traffic.
  - b. Mameco International 'Vulkem 245-255'  
Pacific Polymers 'Elasto-thane 227 High Shore'  
Pecora 'Urexpan NR-200' or 'Dynatred'  
Permapol 'RC-2SL'  
Sika - Sikaflex 2CSL  
Sonneborn 'Sonolastic SL2'

## B. SILICONE SEALANTS

1. Silicone based, single components, non sag, conforming to Federal Spec. TT-5-0030C (2) & TT-S-001543A.
  - a. Joints in glass and metal surfaces of walls and other vertical and sloping surfaces of window surrounds.  
General Electric - GE1200  
Dow Corning - 790  
Pecora 864 or 890  
Sonneborn - Sonolastic 150/Omniseal
  - b. Joints in concrete and masonry in vertical and sloping surfaces.  
General Electric - Silpruf  
Dow Corning - 795  
Pecora 895  
Sonneborn - Sonolastic 150/Omniseal
- C. Joint Backing: Closed cell materials, neoprene, polypropylene, or polyethylene, ASTM D1565 or D1667 conforming to manufacturers written recommendations. Material is to be non-staining, free of asphalt, oils or creosote. Sized and shaped to control depth of sealant and to provide 25 - 50 percent compression upon insertion. Open cell polyurethane foam backer rod is not allowed.
- D. Primers: As recommended in writing by sealant manufacturer. Verify that recommended primer has been tested not to stain the substrate. Refer to 3.01D.
- E. Bond Breaker: Pressure sensitive adhesive polyethylene tape, or other type recommended by sealant manufacturer.
- F. Fire Retardant Sealant: Products as tested and listed by approved system design as indicated in the U.L.Inc Volume 2, directory. System is to be recognized by UL and ASTM E119 procedures, (and ICBO by report NER #243), for fire rating of penetration to be sealed. Products as distributed by Kirwan Corporation (714) 939-6887.
  1. Pecora Ultra-Block fire safing joint system used in conjunction with acrylic latex sealants (AC-20 FTR), polyurethanes or silicones, as approved by the manufacturer, based on hardness or flexibility of the joint required. Alternate mineral wool safings must comply to approved system designs.
  2. 3M - "Fire Barrier Caulk CP25 and Putty 303", or Dow Corning - "Firestop Sealant".
- G. Fire Retardant Foam: UL tested and listed, conforming to ASTM E119 for rating of penetration to be sealed. 3M 2001 RTV "Firestop Foam" or equal.
- H. Structural Glazing Adhesives/Sealants  
One-component, high-modulus, high-strength, neutral-cure, 100 percent silicone polymer sealant.
  1. Acceptable Product: Momentive, GE SSG4000 UltraGlaze Silicone Structural Glazing Adhesive/Sealant as manufactured by Momentive Performance Materials
    - a) Compliance:
      - (1) ASTM C 1184, Type S, Use G and O.
      - (2) ASTM C 920, Type S, Grade NS, Class 25, Use NT, A, G, O.
      - (3) Federal Specification TT-S-001 543A.
      - (4) Federal Specification TT-S-00230C.
    - b) Dynamic Movement Capability, ASTM C 719: +/- 25 percent.
    - c) Color: Black.
    - d) Color: Grey.

## 2.04 INCIDENTAL REQUIREMENTS AND MATERIALS

- A. Staining Characteristics: All joint fillers, primers, or other materials used in conjunction with sealants shall be of such composition as to not cause staining of the sealant or the materials to which they are applied.
- B. Compressible Joint Filler: As recommended by the sealant manufacturer for use in conjunction with the sealant. Size closed cell joint backing for joint width plus 25 percent.
- C. Primers: As recommended by the sealant manufacturer for use in conjunction with the sealant for application onto the various types of materials to which the sealer is applied.
- D. Cleaners, where required in lieu of primers, as recommended by the sealant manufacturer, which will not stain or damage building materials.

## **PART 3- EXECUTION**

### **3.01 EXAMINATION**

Examine substrate surfaces to receive sealant system and associated work and conditions under which work will be installed. Do not proceed with sealants until unsatisfactory conditions have been corrected in a manner acceptable to installer. Starting work within a particular area will be construed as applicators acceptance of surface conditions.

### **3.02 PREPARATION**

- A. Comply with manufacturers latest written requirements, recommendations and specifications for cleaning, surface preparation and priming. Remove loose foreign materials which could impair adhesion or proper performance of sealants.
- B. Prime joint substrates where recommended by joint sealant manufacturer or where required by preconstruction joint sealant substrate tests. Confine primers to areas of joint sealant bond. Do not allow spillage or migration onto adjoining surfaces.
- C. Apply epoxy primers to all concrete surfaces to which joints are to be sealed prior to sealant application to increase adhesion, decreasing failure due to temperature exposure, thermal and structural movement.
- D. Prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

### **3.03 APPLICATION**

- A. Install back-up and sealants in accordance with ASTM C1193 and manufacturers written recommendations as recommended for each use type and substrate, or as directed by manufacturer's technical field representative to ensure proper preparation and application.
- B. Accurately install/position joint back-up to provide support of sealants during application and at position required to control/produce the uniform cross sectional shape and depth of installed sealants relative to designated joint thickness/widths to achieve required width to depth ratios, that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of back-up rod.
  - 2. Do not stretch, twist, puncture or tear back-up rod.
  - 3. Install bond breaker tape where backer rods cannot be used do to shallow joint depth, to avoid three side adhesions.

- C. Install/apply sealants by proven techniques using caulking guns with proper nozzles using sufficient pressure that results in sealants directly contacting and fully wetting joint substrates. Completely fill recesses provided for each joint configuration, providing uniform, cross sectional shapes and depths relative to joint widths, and to assure/obtain uniform adhesion free of air pockets, voids, embedded matter, ridges and sags. During application keep tip of nozzle at bottom of joint, forcing sealant to fill from bottom to top. Finish joints smooth, uniform and free of ridges, wrinkles, sags, air pockets, and embedded impurities.
- D. Tool sealants to form smooth, uniform beads of concave configuration finished below the surface. Use tooling agents that are approved by sealant manufacturer. Remove excess sealants from surface adjacent to joint.
- E. Fire Retardant Foam and Sealant: Conform to manufacturer's printed directions for preparation and application of materials per applicable details for fire-rated penetrations. Seal all gaps, cracks, and holes around the perimeter of materials penetrating the fire rated floors and walls.
- F. Fire Retardant Putty: Apply to thicknesses required for rating and type of construction, in accordance with manufacturer's directions.

#### **3.04 PROTECTION**

- A. Protect joint sealants from contact with contaminating substances or from damage resulting from construction operations or other causes.
- B. Cut out and remove damaged or deteriorated joint sealants and repair so that areas are indistinguishable from original work.

**END OF SECTION**

## **SECTION 08 11 00**

### **STEEL DOORS AND FRAMES**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Non-fire-rated steel doors and frames.
- B. Steel frames for wood doors.
- C. Fire-rated steel doors and frames.
- D. Thermally insulated steel doors.
- E. Sound-rated steel doors and frames.
- F. Steel glazing frames.
- G. Accessories, including glazing, louvers, and matching panels.

##### **1.02 RELATED SECTIONS**

- A. Section 08710 - Door Hardware.
- B. Section 08800 - Glazing: Glass for doors and borrowed lites.
- C. Section 09900 - Paints and Coatings: Field painting.

##### **1.03 REFERENCES**

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 1999.
- C. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- D. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004).
- E. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2005a.
- F. ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box; 1989 (Reapproved 1993).
- G. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2005.
- H. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.
- I. ASTM E 413 - Classification for Rating Sound Insulation; 2004.
- J. ASTM E 1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).
- K. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).
- L. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

- M. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 1999.
- N. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 1992.
- O. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2000.
- P. NAAMM HMMA 862 - Guide Specifications for Commercial Security Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2003.
- Q. NAAMM HMMA 863 - Guide Specifications for Detention Security Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2004.
- R. NAAMM HMMA 865 - Guide Specifications for Swinging Sound Control Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2003.
- S. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 2007.
- T. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2003.
- U. UBC Std 7-2, Part II - Test Standard for Smoke- and Draft-control Assemblies; International Conference of Building Officials; 1997.
- V. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- W. UL 10B - Standard for Fire Tests of Door Assemblies; 1997.
- X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; 1998.
- Y. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; 2001.

#### **1.04 SUBMITTALS**

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- D. Samples: Submit two samples of metal, 2 x 2 inches (50 x 50 mm) in size showing factory finishes, colors, and surface texture.
- E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Maintain at the project site a copy of all reference standards dealing with installation.

#### **1.06 DELIVERY, STORAGE, AND PROTECTION**

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Steel Doors and Frames:
1. Steelcraft; [www.steelcraft.com](http://www.steelcraft.com).
  2. Assa Abloy Ceco; [www.assaabloydss.com](http://www.assaabloydss.com).
  3. Windsor Republic Doors; [www.republicdoor.com](http://www.republicdoor.com).
  4. Substitutions: See Section 01600 - Product Requirements.

### **2.02 DOORS AND FRAMES**

- A. Requirements for All Doors and Frames:
1. Accessibility: Comply with ANSI/ICC A117.1.
  2. Door Top Closures: Flush with top of faces and edges.
  3. Door Edge Profile: Beveled on both edges.
  4. Door Texture: Smooth faces.
  5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
  6. Hardware Preparation: In accordance with DHI A115 Series, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
  7. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
  8. Finish: Factory primed, for field finishing.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

### **2.03 STEEL DOORS**

- A. Exterior Doors Type L-Series:
1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
  2. Grade: NAAMM HMMA 861, physical performance Level A.
  3. Core: Honeycomb core system.
  4. Top Closures for Outswinging Doors:
    - a. Flush with top of faces and edges.
    - b. Not less than 16 ga. Flush or inverted.
    - c. Welded to the face sheet.
  5. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
  6. Texture: Smooth faces.
  7. Astragals: Flat security type.
  8. Weatherstripping: Separate, see Section 08 71 00.
  9. Finish: Kynar.

### **2.04 STEEL FRAMES**

- A. General:
1. Comply with the requirements of grade specified for corresponding door, except:
    - a. ANSI A250.8 Level 1 Doors: 16 gage frames.
    - b. ANSI A250.8 Level 4 Doors: 12 gage frames.
  2. Finish: Same as for door.
  3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
  4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches (100

- mm) high to fill opening without cutting masonry units.
5. Frames wider than 48 Inches (1200 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.
  6. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
  7. Frame Anchors
    - a. Existing Masonry or Concrete
      1. 3/8 inch countersunk flat head bolt and expansion shields.
      2. Locate 6 inches from top and bottom and maximum 24 inches on center.
      3. Weld pipe spacers or other type of spacers, per manufacturers standard design, in back of frame soffit.
    - b. Attachment to Drywall Construction:
      1. Steel or Wood Stud type to accommodate frame jamb depth and face dimension on welded type frame.
    - c. Provide one anchor for every 30 inches of jamb or fraction thereof.
    - d. Floor Anchor: angle clip type.
      1. 16 Gauge.
      2. Two fasteners per jamb.
      3. Weld to bottom of each jamb.
  8. Preparation for Hardware
    - a. Reinforce per SDI 107.
    - b. Lock and Closer reinforcement: box type.
    - c. Door Hinge reinforcement: 7 gauge or equivalent, manufacturer's standard.
    - d. Punch strike jambs to receive three silencers; double leaf frames to receive manufacturer's standard preparation.
    - e. Hardware locations per "Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames".
    - f. Provide welded in place guards for all hardware cutouts in frame.
    - g. Electrical preps: provide welded-in-place boxes, special designed anchors, raceways and access panels as required.
- B. Interior Door Frames: F16 Series, SUA (set-up and welded) 3-sided flush frames; meet ANSI A250.8 – 1998.
1. Single rabbet frame.
  2. 4" head where shown on the Drawings.
  3. Fire-rated when shown on the Drawings.
  4. Finish: Factory primed.
- C. Exterior Door Frames: Face welded, F16 Series, sanded and grinded smooth, seamless with joints filled.
1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
  2. Finish: Kynar
  3. Weatherstripping: Separate, see Section 08 71 00.
- D. Interior Door Frames: See Section 08 11 00.
- E. Mullions for Pairs of Doors: Fixed, of profile similar to jambs.
- F. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.
- G. Transom Bars: Fixed, of profile same as jamb and head.

## 2.05 ACCESSORY MATERIALS

- A. Glazing: As specified in Section 08 81 00, factory installed.
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted



corners; prepared for countersink style tamper proof screws.

- C. Astragals for Double Doors: Specified in Section 08 71 00.
  - 1. Exterior Doors: Steel, Z-shaped.
  - 2. Fire-Rated Doors: Steel, shape as required to accomplish fire rating.
- D. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- F. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

## **2.06 FINISH MATERIALS**

- A. Interior Doors: Factory primed. Exterior Doors: Factory primed.
- B. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- C. Kynar finish. Color to be selected.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### **3.02 PREPARATION**

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.
- B. Coat inside of other frames with bituminous coating to a thickness of 1/16-inch (1.5 mm).

### **3.03 INSTALLATION**

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Coordinate installation of hardware.
- F. Coordinate installation of glazing.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

### **3.04 ERECTION TOLERANCES**

- A. Clearances Between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in (1.5 mm) measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

- A. Adjust for smooth and balanced door movement.

- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Test sound control doors for force to close, latch, and unlatch in accordance with ASTM E 1408; adjust as required to comply.

### **3.06 SCHEDULE**

- A. Refer to Door and Frame Schedule appended to this section.

**END OF SECTION**

**SECTION 08 11 16**  
**Aluminum Doors and Frames**

**Part 1 – General**

**1.01 Summary**

- A. Section includes:
  - 1. Aluminum Doors and Frames
- B. Related Sections:
  - 05 40 00 – Light gauge Framing
  - 07 92 00 – Joint Sealants
  - 08 41 13 – Aluminum Storefront Window System
  - 08 71 00 – Door hardware

**1.02 References**

- A. American Architectural Manufacturers Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. Aluminum Association (AA)

**1.03 System Description**

- A. General: In addition to requirements shown or specified, comply with:
  - 1. Applicable provisions of AAMA Aluminum Storefront and Entrance Manual for design, materials, fabrication and installation of component parts.
- B. Design Requirements: Arcadia MS362 Series Medium Stile Entrance is a single source package of door, doorframe and hardware that is engineered for moderate to high traffic.
- C. Performance Requirements: Each assembly tested by a recognized testing laboratory or agency in accordance with specified test methods.
  - 1. Tested by the dual moment corner joint strength test.

**1.04 Quality Assurance**

- A. Single Source Responsibility:
  - 1. Obtain entrances, storefronts, ribbon walls, window walls, curtain walls, window systems, and finish through one source from a single manufacturer.
- B. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.03.

**1.05 Warranty**

- A. Door warranted against failure and/or deterioration of metals due to manufacturing process for a period of two (2) years.

**Part 2 – Products**

**2.01 Manufacturers**

- A. Acceptable Manufacturers:
  - 1. Arcadia, Inc., 2301 E Vernon, Vernon, CA. Telephone 323/269-7300, Fax 323/269-7390.
- B. Acceptable Products:
  - 1. Arcadia, Inc., MS362 Series, Medium Stile Door 1-3/4".
    - a. Vertical Stiles: 3-1/2 inches.
    - b. Top Rail: 3-5/8 inches.
    - c. Bottom Rail: 10/12 inches.
    - d. Glazing Stops: (Square) snap-in type for (1 inch) Infill.
  - 2. Major portions of the door stiles a nominal .125 inches and glass stops .050 inches thick.

**2.02 Materials and Accessories**

- A. Door members: Extruded 6063-T6 aluminum alloy (ASTM B221-Alloy G.S. 10a T6).

- B. Screws, fastening devices, and internal components: Aluminum, stainless steel, or zinc plated steel in accordance with ASTM A-164. Shall be aluminum or steel, providing the steel is properly isolated from aluminum.
- C. Glazing Gasket (compression-type design).

#### 2.03 Hardware

- A. Hardware furnished and installed by the door manufacturer, and include the following standard hardware (as selected) , Unless Noted Otherwise.
  1. Weatherstripping: Hard-backed poly pile in door and/or frame. Meeting stile of all pair of doors have a double line hard-backed poly-pile astragal.
  2. Threshold: Extruded Aluminum with ribbed surface.
  3. Sill Sweeps: Brush strip (exposed, concealed).
  4. Pivoting/Hinging: (continuous.)
  5. Closers: (Overhead concealed)
  6. Latches/Strike: (Dead-latch combination, two-point.)
  7. Latch Handle: **Refer to Hardware Schedule**
  8. Electric Release: N/A
  9. Locks/Strike: (Maximum security hooklock, deadbolt.)
  10. Auxiliary Locks: (Two-point, three-point, flushbolts.)
  11. Cylinders: (Mortise, rim.)
  12. Panic Devices: (flush mid panel)
  13. Push/Pulls: **Refer to Hardware Schedule**
  14. Cylinder Guard: (Security ring/retainer ring.)
  15. Exit Indicator: (Message panel.)
  16. Transom Decal: (This door to remain . . . )
  17. Door Stop/Holder:
  18. Mail slot.

#### 2.01 Finish

- A. Finish all exposed areas of aluminum and components as indicated.
  1. An Architectural Class II or I color anodic coating conforming with AA-M12C22A34/AA-M12C22A44.
  1. Fluorocarbon Coating: AAMA 2605.2. (to Match existing)
    - a. Resin: 70% PVDF Kynar 500/Hylar 5000.
    - b. Substrate: cleaned and pretreated with chromium phosphate.
    - c. Primer: Manufacturer's standard resin base compatible coating. Dry film thickness.
      - (a) Extrusion: Minimum 0.20 mil.
    - d. Color Coat: 70% PVDF, dry film thickness.
      - (a) Extrusion: 1.0 mil.
    - e. Color: As selected by Architect.
    - f. Acceptable Coatings Manufacturers:
      - (a) PPG Industries, Inc.
      - (b) Valspar Corporation
      - (c) BASF

#### 2.05 Door Fabrication

- A. Stiles and rails shall be tubular sections accurately joined, flush and hairline at corners with heavy concealed reinforcement brackets secured with machine bolts, with optional MIG weld. Exposed screws not permitted.
- B. Each door leaf equipped with an adjusting mechanism, located in the top rail near the lock stile.
- C. Prepare internal reinforcement for door hardware.
- D. Custom hardware templates and physical hardware must be submitted prior to any fabrication.

### Part 3 – Execution

**3.01 Examinations**

- A. Examine conditions and verify substrate conditions are acceptable for product installation.

**3.02 Installation**

- A. Install in accordance with approved shop drawings and manufacturers installation instructions.

**3.03 Field Quality Control**

- A. Make all necessary final adjustments to attain normal operation of each door and its mechanical hardware.

**END OF SECTION**

## **SECTION 08 14 23.16**

### **PLASTIC FACED WOOD DOORS**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. Provide plastic faced wood doors, complete in place with finish hardware installed, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### **1.02 SUBMITTALS**

- A. Comply with pertinent provisions of Section 01 33 23.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Samples, approximately 200 mm x 200 mm (8" x 8") in size, of each of the proposed door face materials.

##### **1.03 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:
  - 1. "Manual of Millwork" of the Woodwork Institute of California, for the grade or grades specified; or
  - 2. "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute, for the grade or grades specified.
  - 3. Certification and stamps will not be required.

##### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 65 00.
- B. Delivery:
  - 1. Deliver doors to site after plaster and cement are dry, and after the building has reached average prevailing humidity of its locality.
  - 2. Deliver prefinished doors in manufacturers' original containers, clearly marked with manufacturer's name, brand name, size, thickness, and identifying symbol on the covering.

**C. Storage:**

1. Stack flat on 50 mm x 100 mm (2" x 4") lumber, laid 300 mm (12") from ends and across center.
2. Under bottom door and over top of stack, provide plywood or corrugated cardboard to protect door surfaces.
3. Store doors in area where there will be no great variations in heat, dryness, and humidity.

**D. Lift doors and carry them into position. Do not drag doors across one another.**

**PART 2 - PRODUCTS**

**2.01 MANUFACTURER**

**A. Acceptable manufacturer: Marshfield Door System or equal products of:**

1. Algoma
2. Edcers

**2.02 MATERIALS**

**A. Provide laminated plastic faced doors of the types, designs, and thicknesses shown on the Door Schedule in the Drawings, labeled or non-labeled as indicated and as required, and in solid core or hollow core as shown on the Door Schedule.**

**B. Except as may be shown otherwise on the Drawings, fabricate the work of this Section to "custom grade" of the referenced organization.**

**C. Faces:**

1. On both faces, provide 3 mm (1/8") thick "Dor-Surf" manufactured by Wilsonart Division of Ralph Wilson Plastics, or an equal approved in advance by the Architect, in colors and patterns selected by the Architect from standard colors and patterns of the approved plastics manufacturer. Use .050 fire-rated laminate at fire-rated doors.
2. On both vertical edges, provide prefinished hardwood.
3. On tops and bottoms of doors, provide a positive sealer applied after completion of machining and fitting.

**PART 3 - EXECUTION**

**3.01 SURFACE CONDITIONS**

**A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.**

**3.02 INSTALLATION**

**A. Fitting and machining laminated plastic faced doors:**

1. Using measurements obtained in the field from installed frames, machine the doors at the factory to fit the prescribed frames with proper clearance at top, bottom, and vertical edges.
2. Replace or rehang doors which are hingebound and do not swing or operate freely.

**B. Finish hardware:**

1. Receive and retain custody of finish hardware furnished under Section 08710 of these Specifications for the work of this Section.
2. Except as otherwise directed by the Architect, install finish hardware in accordance with its manufacturers' recommendations.

**3.03 ADJUST AND CLEAN**

**A. Upon completion of the installation, inspect each component.**

1. Verify that each item has been fabricated and installed in accordance with the specified requirements.
2. Make necessary adjustments.
3. Touch-up as necessary to make surface blemishes permanently invisible to the unaided eye from a distance of 1500 mm (5'-0").

**3.04 COMPLIANCE**

- A. The Owner reserves the right to request and pay for an inspection by a representative of the referenced organization to determine that the work of this Section has been performed in accordance with the specified standards.
- B. In the event such inspection determines the work of this Section does not comply with the specified requirements, immediately remove the non-complying items and replace them with items complying with the specified requirements, all at no additional cost to the Owner, and reimburse the Owner for the cost of the inspection.

**END OF SECTION**



## **SECTION 08 31 00**

### **ACCESS DOORS AND PANELS**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. Section includes:
  - 1. Flush access doors and panels.
  - 2. Related hardware and attachments.

##### **1.02 RELATED SECTION**

- A. Section 09 29 00 - Gypsum Board Assemblies.
- B. Section 09 51 00 - Acoustical Tile Ceilings. And Suspension System
- C. Section 09 90 00 – Paints and Coatings.
- D. Division 15 - Mechanical.
- E. Division 16 – Electrical.

##### **1.03 SYSTEM DESCRIPTION**

- A. Milcor M and MS Access Doors provide critical service access in drywall, masonry or tile walls and offer superior resistance to corrosion.

##### **1.04 SUBMITTALS**

- A. Comply with Sections 01 33 32.
- B. Shop Drawings:
  - 1. Door and panel units: Show types, elevations, thickness of metals, full size profiles of door members.
  - 2. Hardware: Show materials, finishes, locations of fasteners, types of fasteners, locations and types of operating hardware, and details of installation.
- C. General: Show connections of units and hardware to other Work. Include schedules showing location of each type and size of door and panel units.
- D. Product Data: Manufacturer's technical data for each type of access door and panel assembly, including setting drawings, templates, fire-resistive characteristics, finish requirements, and details of anchorage devices.
- E. Include complete schedule, types, locations, construction details, finishes, latching or locking provisions, and other pertinent data.
- F. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

##### **1.05 QUALITY ASSURANCE**

- A. Comply with Section 01 40 00
- B. Single Source Responsibility: Obtain access door and panel units, and frames for entire Project from 1 source and 1 single manufacturer.

**C. Fire-Resistance Ratings:**

1. Where a fire-resistance classification is indicated, provide access door and panel assemblies with panel door, frame, hinge, and latch from manufacturer listed in Underwriter's Laboratories (UL), "Building Materials Directory" for rating shown.
2. Provide 90 minutes UL label at 20 hour rated partitions. Provide 3 hour label at horizontal applications, up to 24 inch wide x 36 inch high.
3. Provide 2 hour label at horizontal applications greater than 24 inch wide x 36 inch high.

**D. Size Variations:** Obtain Architect's acceptance and approval of manufacturer's standard size units that may vary slightly from sizes indicated on Drawings.

**E. Coordination:** Provide inserts and anchoring devices that will be built into other Work for installation of access door assemblies. Coordinate delivery with other Work to avoid delay.

**1.06 DELIVERY, STORAGE AND HANDLING**

**A. Comply with Section 01 65 00**

1. Package and ship per manufacturer's recommendations. One per carton.
2. Store per manufacturer's instructions.
3. Store in dry area out of direct sunlight.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURER**

- A. Equal to Milcor, Telephone: 800.624.8642**
1. Style M and MS Doors
  2. Finish:       Style M Factory Primed field painted  
                  Style MS stainless steel
  3. Location: Use MS Style at wet areas

**2.02 MATERIALS**

- A. Style M, Prime Painted:** 14-gauge steel frame and door panel. Style MS.
- B. Stainless Steel:** 16-gauge stainless steel frame and door panel.

**2.03. ACCESS PANELS**

- A. Finishes:** Milcor access doors are offered in corrosion-resistant, prime-painted and stainless steel surfaces. The prime-painted surface is factory-painted through an electro-static binding process with an ionized power paint and then thermo set in a curing cycle to eliminate runs and bubble. This paint able surface can be used as is, or painted to suit specific décor. Stainless steel models in a satin finish are available for added corrosion resistance
- B. Hinge:** Concealed spring hinges open to 175 degrees. Extracting pin from hinge leaf attached to panel permits panel removal. Number of hinges varies with size of door: check with your Milcor representative for details.
- C. Flush:** Screwdriver-operated with steel cam. Available with Allen head or spanner head cam on special order. Cylinder lock with two keys furnished to replace one cam lock, if required, at slight extra charge.
- D. Anchor:** Milcor M & MS door frames are furnished with masonry anchors, if specified, at slight extra charge. Number of anchors varies per door size requirements.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Comply with Section 01700
- B. Verify that rough openings for door and frame are correctly sized and located.
- C. Verify mechanical and electrical requirements for ceiling or wall access panels.

#### **3.02 PREPARATION**

- A. Advise installers of work relating to access panel installation including rough opening dimensions, locations of supports, and anchoring methods. Coordinate delivery with other work to avoid delay.

#### **3.03 INSTALLATION**

- A. Install access door and frame units per manufacturer's written instructions.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position units to provide convenient access to concealed Work requiring access.

#### **3.04 ADJUST AND CLEAN**

- A. Adjust panel after installation for proper operation.
- B. Remove and replace panels or frames that are warped, bowed, or damaged.

**END OF SECTION**

## **SECTION 08 35 13**

### **EXTERIOR SWINGING FOUR-FOLD DOOR SYSTEMS**

#### **PART 1 – GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. This Section includes exterior swinging Four-Fold metal doors with surface mounted tube frames.
- B. Operation of Four-Fold metal doors includes overhead mounted electro-mechanical operator(s) located on the interior side of the wall.

##### **1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.
- D. Reference list including (5) successful installations of this type of door within the past two (2) years.

##### **1.4 QUALITY ASSURANCE**

- A. Doors shall be designed to withstand external or internal horizontal wind loads of 20 pounds minimum per square foot. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Steel frames shall be designed in accordance with the AISC "Steel Construction Manual".
- B. Door manufacturer shall have at least 10 years experience in manufacturing door type specified for emergency vehicle applications.

##### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling.
- B. Handle materials carefully to prevent damage.

## 1.6 WARRANTY

- A. The door manufacturer shall provide a written standard limited warranty for material and workmanship.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Four-Fold Industrial metal doors manufactured by Door Engineering and Manufacturing, 400 Cherry Street, Kasota, MN 56050, (800)-959-1352 or equal products by other manufacturers approved in advance. Doors distributed by Byron Epp, Inc., 26062 Merit Circle #107, Laguna Hills, CA 92653, (877) 377-6030.

Series: FF100-600XT Series: Exterior Swinging Four-Fold Doors with interior mounted operators.

### 2.2 MATERIALS

- A. Steel Tube: ASTM A513 and ASTM A500/A500M
- B. Steel Sheets: Steel sheets of commercial quality, complying with ASTM A1011/A1011M hot-rolled steel sheet.
- C. Hardware: Manufacturer's standard components.
- D. Fasteners: Zinc-coated steel.
- E. No Substitution.

### 2.3 FOUR-FOLD DOORS

- A. Construction: Door framing shall be minimum 11-gauge structural steel tube with 14-gauge steel sheet on the exterior and interior faces. Sheetting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth and flush.
- B. Angle Frame: Supply pre-hung tube frame system constructed of minimum L6x4x0.25, designed to anchor to masonry wall construction or weld to steel structure. All hinges, track supports and operator supports shall be factory attached.
- C. Factory finish: Operator and operating hardware shall be powdercoated manufacturer's standard gray. Panels, frame and all other hardware shall be finished as follows:
  - a. Option 1: All exposed steel shall be finished with manufacturer's standard epoxy primer and polyurethane top coat, PPG Spectracron or equal. Customer to select from Manufacturer's standard color chart or furnish color to match.
- D. Operating Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, not less than three pairs of jamb and fold hinges per opening, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation. Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Jamb hinges shall be gusseted. Fold hinges shall be dual shear with two thrust bearings. Fold hinges shall be

stainless steel. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum 3/4" diameter hardened steel.

- E. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" cloth inserted neoprene and include no exposed fasteners on the exterior face of the panel. Weatherstripping at sill shall include two 1/16" cloth inserted neoprene sweeps with an aluminum retainer. The retainer shall be attached to the door with adhesive.
- F. Perimeter Weatherstripping: Provide jamb and head weatherstripping of 1/16" cloth-inserted neoprene bulb (or closed cell neoprene).
- G. Vision Panels: Provide 1" insulated vision panels or grilles of the size, shape and location as noted on the drawings.

## 2.4 OPERATOR

- A. Each Four-Fold door shall be operated by an overhead mounted electro-mechanical drive unit designed for high cycle operation. Each Operator consists of an electric motor, gear reducer, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door section and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.
- B. Operator shall be instantly reversible, open and close rapidly and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to free wheeling mode for manual operation.
- C. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be wound for three phase 208/230/480 VAC, 60 Hertz operation.
- D. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. **Incoming electrical shall be (Choose One): 120VAC single phase, 208VAC single phase, 208/230VAC 3-phase, 480VAC 3-phase.**
  - 1. Controls shall include a programmable logic controller with digital message display or LED indicators. Controller shall include programmable close timers and programmable inputs/outputs.
  - 2. Motor starters shall be magnetic reversing, factory wired with overload and under voltage protection, and equipped with mechanical interlocks. All control components shall be enclosed in one enclosure with a wiring diagram placed on the inside of the cover.
  - 3. If incoming voltage is single phase, control panel shall include a variable frequency drive to convert voltage to 3-phase for the motor
  - 4. Enclosures shall be NEMA 4 with disconnect switch.
  - 5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.

6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
7. Safety edges: Provide electric safety edges on leading edge of all doors to reverse door upon contact with obstruction.
8. Photo eyes: Provide (1) interior, jamb mounted, thru-beam type photo eyes, NEMA 4 rated.
9. (Option) Presence Sensor: Provide (1) interior, overhead mounted, presence sensor.
10. (Option) Radio controls: Provide one (1) radio receiver and (1) single button remotes per door. Remotes to open and close doors with single button.
11. (Option) Timer Activation Loop Detectors (fire station applications): Provide "pulse on exit type" loop detector to activate auto close timer once loop has been activated and cleared, include hand/auto switch to deactivate timer. G.C. to coordinate installation of preformed loop with installer prior to exterior apron being poured.
12. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.
- B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

#### **3.2 ADJUSTING AND CLEANING**

- A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.
- B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

**END OF SECTION**

## **SECTION 08 71 00**

### **DOOR HARDWARE**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Hardware for wood, hollow steel and aluminum doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors for which hardware is specified in other sections.
- E. Thresholds.
- F. Weatherstripping, seals and door gaskets.
- G. Gate locks.

##### **1.02 RELATED SECTIONS**

- A. Section 08 11 00 - Steel Door Frames.
- B. Section 08 14 23 16 – Plastic Face Wood Doors
- E. Section 13 85 20 - Fire Alarm System Equipment: Electrical connection to activate door closers.
- F. Card Access System (Allowance # 1)

##### **1.03 ALLOWANCES**

- A. See Section 01 21 00 - Allowances, for allowances affecting this section.

##### **1.04 REFERENCES**

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.
- B. BHMA A156.1 - American National Standard for Butts and Hinges; Builders Hardware Manufacturers Association, Inc.; 2000 (ANSI/BHMA A156.1).
- C. BHMA A156.2 - American National Standard for Bored and Preamsembled Locks & Latches; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.2).
- D. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association; 2001 (ANSI/BHMA A156.3).
- E. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; 2000 (ANSI/BHMA A156.4).
- F. BHMA A156.5 - American National Standard for Auxiliary Locks & Associated Products; Builders Hardware Manufacturers Association; 2001 (ANSI/BHMA A156.5).
- G. BHMA A156.6 - American National Standard for Architectural Door Trim; Builders Hardware Manufacturers Association; 2005 (ANSI/BHMA A156.6).
- H. BHMA A156.7 - American National Standard for Template Hinge Dimensions; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.7).
- I. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; 2005 (ANSI/BHMA A156.8).
- J. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.9).



- K. BHMA A156.12 - American National Standard for Interconnected Locks & Latches; Builders Hardware Manufacturers Association; 2005 (ANSI/BHMA A156.12).
- L. BHMA A156.13 - American National Standard for Mortise Locks & Latches; Builders Hardware Manufacturers Association; 2005 (ANSI/BHMA A156.13).
- M. BHMA A156.14 - American National Standard for Sliding & Folding Door Hardware; Builders Hardware Manufacturers Association; 2002 (ANSI/BHMA A156.14).
- N. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical; Builders Hardware Manufacturers Association; 2006 (ANSI/BHMA A156.15).
- O. BHMA A156.16 - American National Standard for Auxillary Hardware; Builders Hardware Manufacturers Association; 2002 (ANSI/BHMA A156.16).
- P. BHMA A156.17 - American National Standard for Self Closing Hinges & Pivots; Builders Hardware Manufacturers Association, Inc.; 2004 (ANSI/BHMA A156.17).
- Q. BHMA A156.18 - American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association, Inc.; 2000 (ANSI/BHMA A156.18).
- R. BHMA A156.20 - American National Standard for Strap and Tee Hinges and Hasps; Builders Hardware Manufacturers Association; 2006 (ANSI/BHMA A156.20).
- S. BHMA A156.21 - American National Standard for Thresholds; Builders Hardware Manufacturers Association; 2006 (ANSI/BHMA A156.21).
- T. BHMA A156.23 - American National Standard for Electromagnetic Locks; Builders Hardware Manufacturers Association, Inc.; 2004 (ANSI/BHMA A156.23).
- U. BHMA A156.24 - American National Standard for Delayed Egress Locks; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.24).
- V. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000.
- W. DHI A115W Series - Specifications for Wood Door and Frame Preparation for Hardware; Door and Hardware Institute; 2000.
- X. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.
- Y. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; Door and Hardware Institute; 1996.
- Z. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- AA. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 2007.
- AB. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association; 2006.
- AC. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

#### **1.05 SUBMITTALS**

- A. See Section 013 33 23 - Submittal and Substitutions, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
  - 2. Submit manufacturer's parts lists, templates, and cut sheets.

- C. Samples: Prior to preparation of hardware schedule:
  - 1. Submit 1 sample of hinge, latchset, lockset, closer, illustrating style, color, and finish.
  - 2. Samples will be returned to supplier.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- G. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
- H. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Design Professional and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with \_\_\_\_\_ years of experience.
- D. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

#### **1.07 PRE-INSTALLATION MEETING**

- A. Convene one week prior to commencing work of this section.

#### **1.08 DELIVERY, STORAGE, AND PROTECTION**

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

#### **1.09 COORDINATION**

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- B. Furnish templates for door and frame preparation.
- C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- D. Coordinate Owner's keying requirements during the course of the Work.

#### **1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for door closers.

#### **1.11 MAINTENANCE PRODUCTS**

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

#### **1.12 EXTRA MATERIALS**

- A. Provide ten extra key lock cylinders for each master keyed group.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Hinges: Hager Companies: [www.hagerhinge.com](http://www.hagerhinge.com).
  - 1. Stanley Hardware: [www.stanleyworks.com](http://www.stanleyworks.com).
  - 2. Substitutions per Section 01 33 23.
- B. Pivots: Ives: [www.ives.com](http://www.ives.com)
  - 1. Glynn-Johnson: [www.glynn-johnson.com](http://www.glynn-johnson.com).
  - 2. Substitution per Section 01 33 23.
- C. Lock and Latch Sets: Best Access Systems: [www.bestlock.com](http://www.bestlock.com).
  - 1. No substitution.
- D. Mortise Locksets: Best Access Systems: [www.bestlock.com](http://www.bestlock.com).
  - 1. No substitution.
- E. Push/Pulls: Ives: [www.ives.com](http://www.ives.com)
  - 1. Assa Abloy McKinney: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Hager Companies: [www.hagerhinge.com](http://www.hagerhinge.com).
  - 3. Substitutions per Section 01 33 23.
- F. Exit Devices: Von Duprin: [www.vonduprin.com](http://www.vonduprin.com).
  - 1. No substitution.
- G. Closers: LCN: [www.lcnclosers.com](http://www.lcnclosers.com)
  - 1. DORMA Group North America: [www.dorma-usa.com/usa](http://www.dorma-usa.com/usa).
  - 2. Substitution per Section 01 33 23.
- H. Holder/Release: DORMA
  - 1. Substitutions per Section 01 33 23.
- I. Overhead Holders/Stops: Glynn-Johnson: [www.glynn-johnson.com](http://www.glynn-johnson.com)
  - 1. DORMA Group North America: [www.dorma-usa.com/usa](http://www.dorma-usa.com/usa).
  - 2. Substitutions per Section 01 33 23.
- J. Wall, Floor Stops/Holders and Silencers:
  - 1. Ives: [www.ives.com](http://www.ives.com)
  - 2. Hiawatha, Inc: [www.hiawathainc.com](http://www.hiawathainc.com).
  - 3. Substitutions per Section 01 33 23.
- K. Manual and Automatic Bolts: Ives: [www.ives.com](http://www.ives.com)
  - 1. Glynn-Johnson: [www.glynn-johnson.com](http://www.glynn-johnson.com).
  - 2. Hager Companies: [www.hagerhinge.com](http://www.hagerhinge.com).
  - 3. Substitutions per Section 01 33 23..
- L. Gasketing and Thresholds: Pemko Manufacturing Co: [www.pemko.com](http://www.pemko.com).
  - 1. National Guard Products, Inc: [www.ngpinc.com](http://www.ngpinc.com).
  - 2. Assa Abloy McKinney: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 3. Substitutions per Section 01 33 23.
- M. Protection Plates: Ives: [www.ives.com](http://www.ives.com)
  - 1. Assa Abloy McKinney: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Hager Companies: [www.hagerhinge.com](http://www.hagerhinge.com).
  - 3. Substitutions per Section 01 33 23.

- N. Cylindrical Locksets: Best Access Systems: [www.bestlock.com](http://www.bestlock.com)
  - 1. No substitution.
- O. Locksets: Adams Rite: [www.adamsrite.com](http://www.adamsrite.com)
  - 1. No substitution
- P. Electric Strikes: Von Duprin: [www.vonduprin.com](http://www.vonduprin.com)
  - 1. No substitution
- Q. Sliding Door Pull: Trimco: [www.trimco.com](http://www.trimco.com)
- R. Substitutions: See Section 01 33 23-

## **2.03 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS**

- A. Provide products that comply with the following:
  - 1. Applicable provisions of Federal, State, and local codes.
  - 2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
  - 3. Applicable provisions of NFPA 101, Life Safety Code.
  - 4. Fire-Rated Doors: NFPA 80.
  - 5. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
  - 6. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
  - 7. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.
- B. Finishes: Identified in schedule at end of section.

## **2.04 KEYING**

All locks shall be supplied with interchangeable cores keyed by the Owner.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of the correct characteristics.

### **3.02 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
- D. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted:
  - 1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
  - 2. For steel doors and frames: See Section 08 11 00.

3. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

4. Wood doors: See Section 08211.
5. Locksets: \_\_\_\_ inch (\_\_\_\_ mm).
6. Push/Pulls: \_\_\_\_ inch (\_\_\_\_ mm).
7. Dead Locks: \_\_\_\_ inch (\_\_\_\_ mm).
8. Exit Devices: \_\_\_\_ inch (\_\_\_\_ mm).

### 3.03 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 40 00.
- B. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

### 3.04 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust hardware for smooth operation.

### 3.05 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01 65 00.
- B. Do not permit adjacent work to damage hardware or finish.

### 3.06 SCHEDULE

#### HwSet 01 card access (entry)

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CONT. HINGE	112HDEPT	628	IVE
1	EA	ELEC LOCK	40HW-7-DEU-03	626	SCE
1	EA	POWER SUPPLY	PS914	LGR	VON
1	EA	POWER TRANSFER	EPT 10	689	
1	EA	CYLINDER CORE	1C7-2	626	BES
1	EA	CONCEALED CLOSER	2031 HO	MTLPC	LCN
1	EA	MOUNTING PLATE	4020-18	MTLPC	LCN
1	EA	THRSHLD ASSMBLY	8133+8143+8133 COMBO	719	NGP
1		CARD READER	BY OTHERS		

#### HwSet 02 kitchen entry

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW SWING-CLEAR HINGE	5BB1HWSC 4.5 NRP	652	IVE
1	EA	PUBLIC ENTRY LK	4H7C 03H	626	BES
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	SURFACE CLOSER	4041 DEL H MC	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	KICK PLATE	8400 10" X 1" LDW B4E	630	IVE

1	EA	HINGE EDGE GUARD	93LM	630	SBH
1	EA	SEAL	105	BLK	DHS

#### HwSet 03 Bedrooms

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4 NRP	626	IVE
1	EA	CLASSROOM LOCK	45H7R 03H	626	BES
1	EA	SURFACE CLOSER	4040XP	MTLPC	LCN
1	EA	FLOOR STOP	FS410	626	IVE
1	EA	SEAL	105	BLK	DHS

Mount Closer on room side

#### HwSet 03A Bedrooms

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	EXISTING		
1	EA	CLASSROOM LOCK	45H7R 03H	626	BES
1	EA	SURFACE CLOSER	4040XP	MTLPC	LCN
1	EA	SEAL	105	BLK	DHS

Mount Closer on room side

#### HwSet 04 sgl-occ toilet, keyed privacy lock

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4 NRP	630	IVE
1	EA	PRIVACY W/DB & IND	L9496L OCCUPIED/VACANT 03A XL11-422	626AM	SCH
1	EA	PVCY CYLINDER	1E7G4	626AM	BES
1	EA	SURFACE CLOSER	4041 DEL HEDA MC	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	KICK PLATE	8400 10" X 1" LDW B4E	630	IVE
1	EA	SEAL	105	BLK	DHS
1	EA	COAT AND HAT HOOK	582	626	IVE

marble threshold: part of tile package

lock operation: normally unlocked, user enters and projects deadbolt for privacy. To exit, user simply operates the inside lever, retracting latchbolt and deadbolt simultaneously. When locked, special emergency key required to retract the deadbolt and open the door. Note, this lock function not found in Best's literature. Substitute Best brand if function is available on special-order basis.

**HwSet 04A sgl-occ toilet, (D-110)**

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	EXISTING	626	IVE
1	EA	PRIVACY W/DB & IND	L9496L OCCUPIED/VACANT 03A XL11-422	626AM	SCH
1	EA	PVCY CYLINDER	1E7G4	626AM	BES
1	EA	SURFACE CLOSER	4041 DEL HEDA MC	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	KICK PLATE	8400 10" X 1" LDW B4E	630	IVE
1	EA	SEAL	105	BLK	DHS

**HwSet 05 (Door#D-112)**

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	EXISTING		
1	EA	PUSH/PULL PLATE SET	1895-4B, CUPERRO	630AM	TRI
1	EA	SURFACE CLOSER	4041 DEL H MC	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	KICK PLATE	8400 10" X 1" LDW B4E	630	IVE
1	EA	SEAL	105	BLK	DHS

**HwSet 06 storage (D-111 &118)**

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1BSC 4.5 NRP	652	IVE
1	EA	CLASSROOM LK	45H7R 03H	630	BES
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	HINGE-EDGE GUARD	93LM	630	SBH
1	EA	FLOOR STOP	FS410	626	IVE
1	EA	SEAL	105	BLK	DHS

**HWSet 07 Laundry room (D-122 & 123)**

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4 NRP	626	IVE
1	EA	CLASS ROOM LOCK	45H7R 03H	626	BES
1	EA	SURFACE CLOSER	4040XP	MTLPC	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	FLOOR STOP	FS410	626	IVE
1	EA	SEAL	105	BLK	DHS

Mount Closer on the room side

**HWSet 08 (D-108 & 117)**

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4 NRP	626	IVE
1	EA	CLASS ROOM LOCK	45H7R 03H	626	BES
1	EA	SURFACE CLOSER	4040XP	MTLPC	LCN

1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	FLOOR STOP	FS410	626	IVE
1	EA	SEAL	105	BLK	DHS

Mount Closer on the room side

#### HwSet: 09 (D-114A & 120A)

2	EA	HINGE	EXISTING	626	
1	EA	ELECTRIC HINGE	(A) BB1168 X ETW4 (size to match existing)		
1	EA	MORTISE CYLINDER	(D) AS REQUIRED		
1	EA	SFIC CYL. CORE	(D) BLDG. STANDARD		
1	EA	CLOSER	(G) 4010T	ALUM (MOUNT ON ROOM SIDE)	
		LOCK SET	(D) 45HW-7-DEU-3	626	
1	EA	POWER SUPPLY	(F) PSB61	GRY	
1	SET	SEALS	(L) S88D		
1	EA	THRESHOLD	EXISTING		
1	EA	CARD READER	BY OTHERS		

#### HwSet 10 (Doors # D-119 & 121)

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HINGE	3CB1 5 X 4.5 NRP	630	IVE
1	SET	CONST LATCHING BOLT	FB61P	630	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	CLASSROOM LK	45H7R 03H	630	BES
2	EA	DOOR HOLDER	PAH60	MTLPC	LCN
1	EA	SMOOTH-FACE ASTRGL	158-N	628	NGP
1	EA	SILL PLATE	818 4" COMBO	719	NGP

#### HwSet 11 (Doors D-109 & 120)

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4 NRP	626	IVE
1	EA	OFFICE LOCK	45H7AB 03H	626	BES
1	EA	FLOOR STOP	FS410	626	IVE
1	EA	SEAL	105	BLK	DHS

END OF SCHEDULE



## **SECTION 08 51 13**

### **ALUMINUM WINDOWS**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. Section includes:
  - 1. Aluminum Windows

##### **1.02 RELATED SECTIONS**

- A. 07 92 00 – Joint Sealant
- B. 08 11 00 - Steel Doors and Frames: Glazed doors

##### **1.03 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. Aluminum Association (AA)
- D. National Wood Window & Door Association (NWWDA)

##### **1.04 SYSTEM DESCRIPTION**

- A. General: In addition to requirements shown or specified, comply with:
  - 1. Applicable provisions of AAMA Windows and Sliding Glass Doors Manual for design, materials, fabrication and installation of component parts.
- B. Design Requirements: Arcadia ULT-500 Series HS-HC70/AW50 (thermal/nonthermal) Heavy Commercial Sliding Windows 4-inch depth.
- C. Performance Requirements: Each assembly shall be tested by a recognized testing laboratory or agency in accordance with specified test methods.
  - 1. Conformance to HS-HC70/AW50 specifications in AAMA/NWWDA 101/I.S. 2-97.
    - a. Air Infiltration: Accordance with ASTM E 283.
    - b. Water Resistance: Accordance with ASTM E 331.

##### **1.05 QUALITY ASSURANCE**

- A. Single Source Responsibility:
  - 1. Obtain entrances, storefronts, ribbon walls, window walls, curtain walls, window systems, and finish through one source from a single manufacturer.
- B. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.03.

##### **1.06 WARRANTY**

- A. Warranted against failure and/or deterioration of metals due to manufacturing process for a period of two (2) years.

## **Part 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Acceptable Manufacturers:
  - 1. Arcadia Architectural Products, Inc., 60 Bonner Street, Stamford, CT. 203-316-8000, fax 203-316-8200.
- B. Acceptable Products:
  - 1. Arcadia, ULT-500 Series (thermal/nonthermal) Heavy Commercial Sliding Windows, 4" depth.

### **2.02 MATERIALS**

- A. All windows shall be fabricated from aluminum extrusions of 6063-T6 alloy and temper with a minimum wall thickness of 0.100" for the sill member and a minimum of 0.072" for all other members, including frame, sash and optional sash dividers. The aluminum shall be free of defects which impair strength and appearance.
- B. Component parts and accessories shall be of aluminum alloy, stainless steel or non-metallic materials which will neither deteriorate nor promote corrosion.
- C. Thermal break barrier shall provide a continuous uninterrupted thermal separation around the entire perimeter of the frame and sash and shall not be bridged by any metal conductor at any point. Thermal barrier shall consist of a two-part, chemically curing, high-strength urethane.
- D. Sill shall have a full-length nylon track cap.
- E. Sash members shall have a minimum of 3/4" glass penetration into the aluminum to provide extra protection against "blow out" during high wind conditions.
- F. Operable sash shall be equipped with two steel tandem ball bearing (all stainless steel tandem rollers and housings optional).
- G. Locking device Adams-Rite MS+1847 stainless steel mortise lock operated by a custom flush pull handle set available in either black or metallic gray powder coat.
- H. Horizontal member shall have two contact points incorporating silicone treated woven pile with mylar center fins. Vertical members shall have four contact points of silicone treated woven pile with mylar center fins. All shall be held in integral extruded slots and secured to prevent movement or loss while operating sash.
- I. Fixed and/or sliding sash members shall be constructed to allow for either factory or field glazing. Sash glazing shall be accomplished using a "marine" style reusable, wraparound black flexible polyvinyl chloride material per commercial standard CS230-60 without the need for separate glazing beads or putty style bedding compounds. The glazing channel shall be provided with the unit for either 1" insulating glass or 1/4" single glass.
- J. All assembly and installation screws shall be 18-8 or 410 stainless steel.
- K. Screens made of extruded aluminum frame and screened with 18 x 16 fiber mesh.

### **2.03 FINISH**

- A. Finish all exposed areas of aluminum and components as indicated.
  - 1. Dark Bronze Anodized Class 1 (0.7 mils thick) meeting AAMA 608.1.
  - (or) 1. Standard finish is Quaker Bronze PPG UC-72867 – baked-on enamel – polycron – AAMA 2603.2.
  - (or)

1. Custom colors in a baked-on enamel or Duranar finish are also available – AAMA 2604.2 and AAMA 2605.2.

## **2.04 FABRICATION**

- A. Primary frame must be a minimum of 4" deep.
- B. Frame corner joint shall be secured with two stainless steel screws and must be back caulked under the frame jambs to insure a weather-resistant seal.
- C. Profile of the fixed jamb and the latching jamb shall include two weather-stripped pockets to receive the fixed and latching stiles.
- D. Fixed and sliding panels shall have a nominal 1-1/2" depth and shall have overlapped joints as well as the mortise type to provide strong interlocking, mechanically fastened hairline joints.
- E. Interlockers and latching stiles shall be heavy gauge tubular sections assuring precise alignment and to resist twisting under load conditions.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATIONS**

- A. Examine conditions and verify substrate conditions are acceptable for product installation.
- B. Verify measurements prior to ordering.

### **3.02 INSTALLATION**

- A. Install in accordance with approved shop drawings and manufacturers installation instructions.

### **3.03 FIELD QUALITY CONTROL**

- A. Contractor's responsibility to make all necessary final adjustments to attain normal operation of each window and its mechanical hardware.

**END OF SECTION**

## **SECTION 08 81 00**

### **GLAZING**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Glass.
- B. Glazing compounds and accessories.

##### **1.02 RELATED SECTIONS**

- A. Section 07 92 00 – Joint Sealant
- B. Section 08 11 00 - Steel Doors and Frames: Glazed doors and borrowed lites.
- C. Section 08 14 23 16 – Plastic Laminated Faces Wood Doors

##### **1.03 REFERENCES**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2004.
- C. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005.
- D. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2005.
- E. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- F. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- G. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2003.
- H. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005a.
- I. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- J. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- K. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- L. ASTM E 1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2004.

- M. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2002.
- N. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2004.
- O. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.
- P. GANA (LGDG) - Laminated Glazing Reference Manual; Glass Association of North America; 2006.
- Q. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

#### **1.04 PERFORMANCE REQUIREMENTS**

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
  - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
  - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
  - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- B. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with Chapter 24, California Building Code, 2001.
  - 1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
  - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  - 3. Thicknesses listed are minimum.

#### **1.05 SUBMITTALS**

- A. See Section 01 33 23 - Administrative Requirements, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit two samples 12 x 12 inch (300 x 300 mm) in size of glass and plastic units, showing coloration and design.
- E. Samples: Submit 1-inch (25 mm) long bead of glazing sealant. Color to be selected.
- F. Certificates: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Certificate: Certify that glass meets or exceeds specified requirements.

#### **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with documented experience.

## **1.07 PRE-INSTALLATION MEETING**

- A. Convene one week before starting work of this section.

## **1.08 ENVIRONMENTAL REQUIREMENTS**

- A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## **1.09 WARRANTY**

- A. See Section 01 78 36 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
- C. Provide a five (5) year warranty to include coverage for delamination of laminated glass and replacement of same.

## **1.10 MAINTENANCE PRODUCTS**

- A. Provide two of each glass size and each glass type, of insulated glass units.

## **PART 2 - PRODUCTS**

### **2.01 FLAT GLASS MATERIALS**

- A. Manufacturers:
  - 1. PPG Industries, Inc: [www.ppg.com](http://www.ppg.com).
  - 2. Pilkington Building Products North America: [www.pilkington.com](http://www.pilkington.com).
  - 3. ACH Glass/Versalux: [www.versaluxglass.com](http://www.versaluxglass.com).
  - 4. Substitutions: Refer to Section 01600 - Product Requirements.

#### **INTERIOR:**

- A. **(Type I): 1" Insulated Glass Unit (Exterior Windows)**
  - 1. By: PPG Industries, 888.774.4332
  - 2. Solarban 70XL, (2) (1/4" / 1/2"AS / 1/4") by PPG Certified fabricator familiar with the manufacturing process of Solarban 70XL,
  - 3. Comply with ASTM
- B. **(Type II): Safety Glass (Type I): Clear; fully tempered with horizontal tempering.**
  - 1. Laminated with 0.030 inch (0.76 mm) thick plastic interlayer; comply with ASTM C 1172
  - 2. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
  - 3. Comply with 16 CFR 1201 test requirements for Category II.
  - 4. Comply with ANSI Z97.1.
  - 5. Where glazing is to be installed in fire-rated partition, provide glazing that is also fire-protection rated in accordance with applicable code.
  - 6. 1/4", 6 mm minimum thick.
  - 7. Provide this type of glazing in the locations required by code.
    - a. Glazed lites in doors except fire doors.
    - b. Glazed sidelights to doors.

**C. Acid-Etched Laminated Glass (Type III) by: Vision Glass**

1. Distributor: Goldray Industries Ltd., 800.640.3709
2. 1/4" thick, tempered, Style # S10663 Royal Satin
3. Comply with ASTM.

**2.02 GLAZING COMPOUNDS**

**A. Manufacturers:**

1. Bostik, Inc: [www.bostik-us.com](http://www.bostik-us.com).
2. GE Silicones: [www.gesilicones.com](http://www.gesilicones.com).
3. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
4. BASF Construction Chemicals, Inc: [www.chemrex.com](http://www.chemrex.com).
5. Substitutions: Refer to Section 01 33 23

**B. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; custom color.**

**C. Polyurethane Sealant (Type 2): Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range 20 to 35; color to be selected.**

**D. Silicone Sealant (Type 3): Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; clear color.**

**2.03 GLAZING ACCESSORIES**

**A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.**

**B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.**

**C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper.**

**1. Manufacturers:**

- a. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
- b. Tremco, Inc: [www.tremcosealants.com](http://www.tremcosealants.com).
- c. Substitutions: Refer to Section 01 33 23.

**D. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to affect an air barrier and vapor retarder seal.**

**1. Manufacturers:**

- a. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
- b. Saint-Gobain Performance Plastics: [www.plastics.saint-gobain.com](http://www.plastics.saint-gobain.com).
- c. Substitutions: Refer to Section 01 33 23.

**E. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.**

**F. Glazing Clips: Manufacturer's standard type.**

**G. Smoke Removal Unit Targets: Adhesive targets affixed to glass to identify glass units intended for removal for smoke control.**

## **2.04 SOURCE QUALITY CONTROL AND TESTS**

- A. Provide shop inspection and testing for safety glass.
- B. Test samples in accordance with ANSI Z97.1.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.02 PREPARATION**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

### **3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)**

- A. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

### **3.04 INSTALLATION - EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)**

- A. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- E. Trim protruding tape edge.



### **3.05 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- A. Cut glazing tape to length and set against permanent stops, 3/16 inch (5 mm) below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
- D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
- E. Install removable stops, with spacer strips inserted between glazing and applied stops below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.
- F. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch (9 mm) below sight line.
- G. Apply cap bead type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.06 INSTALLATION - EXTERIOR WET METHOD (SEALANT AND SEALANT)**

- A. Place setting blocks at 1/4 points and install glazing pane or unit.
- B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch (600 mm) intervals, 1/4 inch (6 mm) below sight line.
- C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 3/8 inch (9 mm) below sight line to ensure full contact with glazing and continue the air and vapor seal.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.07 INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY)**

- A. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
- B. Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
- C. Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
- D. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
- E. Remove masking tape.

### **3.08 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)**

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.

- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.

### **3.09 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)**

- A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
- C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch (600 mm) intervals, 1/4 inch (6 mm) below sight line.
- E. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- F. Trim protruding tape edge.

### **3.10 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)**

- A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch (600 mm) centers, kept 1/4 inch (6 mm) below sight line.
- B. Locate and secure glazing pane using glazers' clips.
- C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

### **3.11 INSTALLATION - PLASTIC FILM**

- A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- B. Place without air bubbles, creases or visible distortion.
- C. Fit tight to glass perimeter with razor cut edge.

### **3.12 MANUFACTURER'S FIELD SERVICES**

- A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- B. Monitor and report installation procedures and unacceptable conditions.

### **3.13 CLEANING**

- A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

### **3.14 PROTECTION OF FINISHED WORK**

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

### **3.15 SCHEDULE**

A. Aluminum Windows: Exterior

B. Plastic Laminated Doors:

1. Fire-rated: Firelite glass, interior wet method.
2. Interior: Type 1, 6 mm thick, interior wet method.

**END OF SECTION**

## **SECTION 09 22 16.13**

### **NON-STRUCTURAL METAL STUD FRAMING**

#### **PART 1 - GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

##### **1.02 RELATED SECTIONS**

- A. Section 05 54 00 – Light Gage Metal Framing
- B. Section 08 31 00 - Access Doors and Panels.
- C. Section 09 29 00- Gypsum Board Assemblies: Metal studs for gypsum board partition framing.

##### **1.03 REFERENCES**

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (Replaced SG-971)
- B. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2004a.
- C. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2001.
- D. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2004.
- E. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2004.
- F. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.
- G. ASTM E 413 - Classification for Rating Sound Insulation; 2004.
- H. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

##### **1.04 SUBMITTALS**

- A. See Section 01 33 23 – Submittal and Substitutions, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
  - 2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

## 1.05 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-structural steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency. Products used in the assembly shall carry a classification label from a testing laboratory acceptable to authority having jurisdiction.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

## 1.06 MOCK-UP

- A. Provide mock-up of stud wall, ceiling, and soffit framing including insulation, sheathing, window frame, and door frame and finish specified in other sections. Coordinate with installation of associated work specified in other sections.
  - 1. Mock-up Size: Full height, minimum 12 feet (3.5 m) long, including corner.
  - 2. Mock-up may remain as part of the Work.

## 1.07 PROJECT CONDITIONS

- A. Coordinate the placement of components to be installed within stud framing system.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories: Member of Steel Stud Manufacturer's Association.
  - 1. Dietrich Metal Framing; [www.dietrichindustries.com](http://www.dietrichindustries.com).
  - 2. Equal products by: Clark Steel Framing Systems; [www.clarksteel.com](http://www.clarksteel.com).
  - 3. Substitutions: See Section 01 33 23

### 2.02 FRAMING MATERIALS

- A. Fire Rated Assemblies: Comply with applicable code and as follows:
  - 1. Fire Rated Partitions: Listed assembly by UL, No. U419 or U448; 1-hour rating.
  - 2. Fire Rated Partitions: Listed assembly by UL, No. U412 or U419; 2-hour rating.
  - 3. Fire Rated Ceiling and Soffits: Listed assembly by UL, No. \_\_\_\_; \_\_\_\_ hour rating.
  - 4. Fire Rated Shaft Wall Requirements: Listed assembly by UL, No. \_\_\_\_; \_\_\_\_ hour rating.
- B. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
  - 1. Studs: C shaped with flat or formed webs with knurled faces.
  - 2. Runners: U shaped, sized to match studs.
  - 3. Ceiling Channels: C shaped.
  - 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
- C. Ceiling Hangers: Type and size as specified in ASTM C 754 for spacing required.
- D. Partition Head to Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.
- E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing

rotation of studs while maintaining structural performance of partition.

1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
  2. Material: ASTM A 653/A 653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
  4. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet (3660 mm).
- F. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud.
- G. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C 754.
- H. Fasteners: ASTM C 1002 self-piercing tapping screws.
- I. Sheet Metal Backing: 0.036 inch (0.9 mm) thick, galvanized.
- J. Anchorage Devices: Power actuated.
- K. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness: As indicated on drawings.
- L. Acoustic Insulation: As specified in Section 07212.
- M. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board. Provide Sheetrock Brand acoustical sealant manufactured by USG.
- N. Acoustic Sealant: As specified in Section 09260.
- ). Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

## **2.03 FABRICATION**

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

### **3.02 INSTALLATION OF STUD FRAMING**

- A. Comply with requirements of ASTM C 754.
- B. Extend partition framing to structure where indicated and to ceiling in other locations.
- C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- D. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs as indicated.

- E. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- F. Align and secure top and bottom runners at 24 inches (600 mm) on center.
- G. At partitions indicated with an acoustic rating:
  - 1. Provide components and install as required to produce STC rating of 52, based on published tests by manufacturer conducted in accordance with ASTM E 90 with STC rating calculated in accordance with ASTM E 413.
  - 2. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
  - 3. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.
- H. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- I. Install studs vertically at 12 inches (300 mm) on center.
- J. Install studs vertically at spacing indicated on drawings.
- K. Align stud web openings horizontally.
- L. Secure studs to tracks using crimping method. Do not weld.
- M. Stud splicing is not permissible.
- N. Stud splicing is permissible; splice studs with 8 inch (200 mm) nested lap, secure each stud flange with flush head screw.
- O. Fabricate corners using a minimum of three studs.
- P. Double stud at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.
- Q. Brace stud framing system rigid.
- R. Coordinate erection of studs with requirements of door frames; install supports and attachments.
- S. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work to be placed within or behind stud framing.
- T. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures.
- U. Use sheet metal backing for reinforcement of partitions with wall-hung cabinetry, and as indicated on the drawings.

### **3.03 CEILING AND SOFFIT FRAMING**

- A. Comply with requirements of ASTM C 754.
- B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- C. Install furring independent of walls, columns, and above-ceiling work.
- D. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.

- E. Space main carrying channels at maximum 72 inch (1 800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.
- F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- G. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.
- H. Reinforce openings in suspension system which interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches (600 mm) past each opening.
- I. Laterally brace suspension system.

#### **3.04 ERECTION TOLERANCES**

- A. Maximum Variation from True Position: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb: 1/8 inch in 10 feet (3 mm in 3 m).

**END OF SECTION**



## **SECTION 09 29 00**

### **GYPSUM BOARD**

#### **PART 1 – GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Exterior gypsum board for ceilings and soffits.
- B. Related Requirements:
  - 1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
  - 2. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

##### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

##### **1.4 QUALITY ASSURANCE**

- A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Install mockups for the following:
    - a. Each level of gypsum board finish indicated for use in exposed locations.
    - b. Each texture finish indicated.
  - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
  - 3. Simulate finished lighting conditions for review of mockups.
  - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

##### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

##### **1.6 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 – PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. **Moisture- and Mold-Resistant Assemblies:** Provide and install moisture- and mold-resistant glass-mat gypsum wallboard products with moisture-resistant surfaces complying with ASTM C 1658 and ASTM C 1177 where indicated on Drawings and in all locations which might be subject to moisture exposure during construction.
- B. **Fire-Resistance-Rated Assemblies:** For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- C. **STC-Rated Assemblies:** For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- D. **Low-Emitting Materials:** For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

### **2.2 GYPSUM BOARD, GENERAL**

- A. **Recycled Content of Gypsum Panel Products:** Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10% percent.
- B. **Size:** Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### **2.3 INTERIOR GYPSUM BOARD**

- A. **Basis-of-Design Product:** The design for each type of gypsum board and related products is based on Georgia-Pacific Gypsum products named. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  1. USG Corporation
  2. American Gypsum
  3. National Gypsum Company
  4. CertainTeed Corp.
  5. Lafarge North America Inc.
  6. PABCO Gypsum
- B. **Gypsum Wallboard:** ASTM C 1396/C 1396M.
  1. **Basis-of-Design Product:** Georgia-Pacific Gypsum; DensArmor Plus High-Performance Interior Panel
  2. **Thickness:** 1/2 inch (12.7 mm).
  3. **Long Edges:** Tapered.
- C. **Gypsum Board, Type X:** ASTM C 1396/C 1396M.
  1. **Basis-of-Design Product:** Georgia-Pacific Gypsum; DensArmor Plus Fireguard High-Performance Interior Panel

2. Thickness: 5/8 inch (15.9 mm).
  3. Long Edges: Tapered.
- D. Flexible Gypsum Board: ASTM C 1396/C 1396M. Manufactured to bend to fit radii and to be more flexible than standard regular-type gypsum board of same thickness.
1. Basis-of-Design Product: Georgia-Pacific Gypsum; "ToughRock FlexRoc Gypsum Board".
  2. Thickness: 1/4 inch (6.4 mm).
  3. Long Edges: Tapered.
- E. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
1. Basis-of-Design Product: Georgia-Pacific Gypsum; DensArmor Plus High-Performance Interior Panel
  2. Thickness: 1/2 inch (12.7 mm).
  3. Long Edges: Tapered.
- F. Foil-Backed Gypsum Board: ASTM C 1396/C 1396M.
1. Core: [3/8 inch (9.5 mm), regular type] [1/2 inch (12.7 mm), regular type] [5/8 inch (15.9 mm), Type X] [Type C as required by fire-resistance-rated assembly indicated on Drawings].
  2. Long Edges: Tapered.
- G. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 3.
1. Basis-of-Design Product: Georgia-Pacific Gypsum; DensArmor Plus Abuse-Resistant Panel.
  2. Thickness: 5/8 inch (15.9 mm).
  3. Long Edges: Tapered.
- H. Impact-Resistant Gypsum Board: ASTM C 1629/C 1629M.
1. Basis-of-Design Product: Georgia-Pacific Gypsum; "DensArmor Plus Impact-Resistant Panel".
  2. Thickness: 5/8 inch (15.9 mm).
  3. Long Edges: Tapered.
- I. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Basis-of-Design Product: Georgia-Pacific-P Gypsum; "[DensArmor Plus High-Performance Interior Panel] [DensArmor Plus Fireguard High-Performance Interior Panel] [DensArmor Plus Fireguard C High-Performance Interior Panel]"
  2. Core: [1/2 inch (12.7 mm), regular type] [5/8 inch (15.9 mm), Type X] [1/2 inch (12.7 mm), type C] [5/8 inch (15.9 mm), Type C].
  3. Long Edges: Tapered.
  4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## 2.4 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "[DensArmor Plus Fireguard C High-Performance Interior Panel] or a comparable product by one of the following:
    - a. USG Corporation
    - b. American Gypsum
    - c. National Gypsum Company

- d. CertainTeed Corp.
  - e. Lafarge North America Inc.
  - f. PABCO Gypsum
- 2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
  - 3. Long Edges: Tapered.
- B. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
- 1. Products: Subject to compliance with requirements
    - a. Georgia-Pacific Gypsum LLC; DensArmour Plus.
  - 2. Core: [5/8 inch (15.9 mm), Type X] [5/8 inch (15.9 mm), Type C] [5/8 inch (15.9 mm), abuse resistant] [5/8 inch (15.9 mm), impact resistant] and as indicated on the drawings
  - 3. Long Edges: Tapered.
  - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- C. Acoustically Enhanced Gypsum Board: ASTM C 1396/C 1396M. Multilayer products constructed of two layers of gypsum boards sandwiching a viscoelastic sound-absorbing polymer core.
- 1. Products: Subject to compliance with requirements,
    - a. National Gypsum Company; Sound Break.
    - b. Quiet Solution, Quiet Rock.
  - 2. Core: [5/8 inch (15.9 mm), regular type] [5/8 inch (15.9 mm), Type X] [1-3/8 inch (35 mm), regular type] and as indicated on the drawings.
  - 3. Long Edges: Tapered.
- D. Skim-Coated Gypsum Board: ASTM C 1396/C 1396M. Manufactured with a factory-applied skim coat.
- 1. Products: Subject to compliance with requirements,
    - a. Lafarge North America Inc.; Rapid Deco L5.
  - 2. Core: [1/2 inch (12.7 mm), regular type] [5/8 inch (15.9 mm), Type X] and as indicated on the drawings.
  - 3. Long Edges: Tapered.

## 2.5 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

- A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "ToughRock Soffit Board" or a comparable product by one of the following:
    - a. USG Corporation
    - b. American Gypsum
    - c. National Gypsum Company
    - d. CertainTeed Corp.
    - e. Lafarge North America Inc.
    - f. PABCO Gypsum
  - 2. Core: [As indicated] [1/2 inch (12.7 mm), regular type] [5/8 inch (15.9 mm), Type X].
- B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "DensGlass Sheathing" or a comparable product by one of the following:

- a. USG Corporation.
  - b. CertainTeed Corp.
  - c. National Gypsum Company.
  - d. Core: As indicated on the drawings.
2. Size: [48 by 96 inches (1219 by 2438 mm)] [48 by 108 inches (1219 by 2743 mm)] [48 by 120 inches (1219 by 3048 mm)] [1200 by 2400 mm] [1200 by 2750 mm] [1200 by 3050 mm].
- C. Glass-Mat Gypsum Interior Board: ASTM C 1658/1658M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "DensArmor Plus" or a comparable product by one of the following:
    - a. National Gypsum Company.
  2. Core: As indicated on the drawings
  3. Long Edges: Tapered.
- D. Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177:
1. Thickness: 1/2 inch.
  2. Width: 4 feet.
  3. Length: [8 feet] [9 feet] [10 feet].
  4. Weight: 1.9 lb/sq. ft.
  5. Edges: Square.
  6. Surfacing: Fiberglass mat on face, back, and long edges.
  7. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 540 pounds per square foot, dry.
  8. Flexural Strength, Parallel (ASTM C473): 80 lbf, parallel.
  9. Humidified Deflection (ASTM C1177): Not more than 2/8 inch.
  10. Permeance (ASTM E96): Not less than 23 perms.
  11. R-Value (ASTM C518): 0.56.
  12. Mold Resistance (ASTM D3273): 10, in a test as manufactured.
  13. Microbial Resistance (ASTM D6329, UL Environmental GREENGUARD 3-week protocol): Will not support microbial growth.
  14. Acceptable Products:
    - a. 1/2 inch DensGlass Sheathing, Georgia-Pacific Gypsum LLC.
- E. Fire-Rated Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177, Type X:
1. Thickness: 5/8 inch.
  2. Width: 4 feet.
  3. Length: [8 feet] [9 feet] [10 feet].
  4. Weight: 2.5 lb/sq. ft.
  5. Edges: Square.
  6. Surfacing: Fiberglass mat on face, back, and long edges.
  7. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 654 pounds per square foot, dry.
  8. Flexural Strength, Parallel (ASTM C1177): 100 lbf, parallel.
  9. Humidified Deflection (ASTM C1177): Not more than 1/8 inch.
  10. Permeance (ASTM E96): Not less than 17 perms.
  11. R-Value (ASTM C518): 0.67.
  12. Mold Resistance (ASTM D3273): 10, in a test as manufactured.
  13. Microbial Resistance (ASTM D6329, UL Environmental GREENGUARD 3-week protocol): Will not support microbial growth.
  14. Acceptable Products:
    - a. 5/8 inch DensGlass Fireguard Sheathing, Georgia-Pacific Gypsum LLC.

## 2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc
2. Shapes:
  - a. Cornerbead.
  - b. Bullnose bead.
  - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - d. L-Bead: L-shaped; exposed long flange receives joint compound.
  - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
  - f. Expansion (control) joint.
  - g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized steel sheet
2. Shapes:
  - a. Cornerbead.
  - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements:
  - a. Fry Reglet Corp.
  - b. Flannery
  - c. Pittcon Industries
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified

## 2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Exterior Glass Mat Gypsum Soffit: Fiberglass mesh.
4. Glass-Mat Gypsum Wallboard: 10-by-10 fiberglass mesh.
5. Glass-Mat Gypsum Sheathing Board: 10-by-10 fiberglass mesh.
6. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
  - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound, ToughRock Ready Mix All-Purpose Joint Compound.
  - b. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.

- a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound, ToughRock Ready Mix All-Purpose Joint Compound, ToughRock Ready Mix Topping Joint Compound.
- 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
  - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound, ToughRock Ready Mix All-Purpose Joint Compound, ToughRock Ready Mix Topping Joint Compound.
- 5. Skim Coat: For final coat of Level 5 finish, use [setting-type, sandable topping compound] [drying-type, all-purpose compound].
  - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound, ToughRock Ready Mix All-Purpose Joint Compound, ToughRock Ready Mix Topping Joint Compound.
- D. Joint Compound for Exterior Soffit Applications:
  - 1. Basis-of-Design Product: Georgia-Pacific Gypsum; "ToughRock Setting Compound."
  - 2. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
  - 3. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.
- E. Joint Compound for Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
  - 2. Cementitious Backer Units: As recommended by backer unit manufacturer.

## 2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  - 1. Laminating adhesive shall have a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
  - 2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10% percent.
- E. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. USG Corporation; SHEETROCK Acoustical Sealant.
  - b. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
  - c. Grabber Construction Products; Acoustical Sealant GSC.
  - d. Pecora Corporation; [AC-20 FTR] [AIS-919].
2. Acoustical joint sealant shall have a VOC content of 250g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

F. Thermal Insulation: As indicated on the drawings.

G. Vapor Retarder: As indicated on the drawings.

## **2.9 FINISHES**

- A. Primer: As recommended by textured finish manufacturer.

## **Part 3 – EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 APPLYING AND FINISHING PANELS, GENERAL**

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.



3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### **3.3 APPLYING INTERIOR GYPSUM BOARD**

- A. Install interior gypsum board in the following locations:
  1. Wallboard Type: As indicated on drawings.
  2. Type X As indicated on drawings.
  3. Ceiling Type: As indicated on drawings.
  4. Foil-Backed Type: As indicated on drawings.
  5. Abuse-Resistant Type: As indicated on drawings.
  6. Impact-Resistant Type: As indicated on drawings.
  7. Moisture- and Mold-Resistant Type: As indicated on drawings.
  8. Type C: As indicated on drawings.
  9. Glass-Mat Interior Type: As indicated on drawings.
  10. Acoustically Enhanced Type: As indicated on drawings.
- B. Single-Layer Application:
  1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. Usually retain first subparagraph below if vertical application of panels is specified.
  3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints.
  4. Locate edge joints over furring members.
  5. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

**C. Multilayer Application:**

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

**D. Laminating to Substrate:** Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

**E. Curved Surfaces:**

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c.

**3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS**

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.**
1. Install with 1/4-inch (6.4-mm) open space where panels abut other construction or structural penetrations.
  2. Fasten with corrosion-resistant screws.

**3.5 APPLYING TILE BACKING PANELS**

- A. Glass-Mat, Water-Resistant Backing Panels:** Comply with manufacturer's written installation instructions and install at [showers, tubs, and where indicated] [locations indicated to receive tile]. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
- B. Cementitious Backer Units:** ANSI A108.11, at [showers, tubs, and where indicated] [locations indicated to receive tile].
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.**

**3.6 INSTALLING TRIM ACCESSORIES**

- A. General:** For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints:** Install control joints [at locations indicated on Drawings] [according to ASTM C 840 and in specific locations approved by Architect for visual effect].

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners [unless otherwise indicated].
2. Bullnose Bead: Use [at outside corners] [where indicated] <Insert requirements>.
3. LC-Bead: Use [at exposed panel edges] <Insert requirements>.
4. L-Bead: Use [where indicated] <Insert requirements>.
5. U-Bead: Use [at exposed panel edges] [where indicated] <Insert requirements>.
6. Curved-Edge Cornerbead: Use at curved openings.

D. Exterior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. LC-Bead: Use [at exposed panel edges] <Insert requirements>.

E. Aluminum Trim: Install in locations [indicated on Drawings] <Insert requirements>.

### 3.7 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints[, rounded or beveled edges,] and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: [Panels that are substrate for tile] [Panels that are substrate for acoustical tile] [Where indicated on Drawings] <Insert locations>.
3. Level 3 is suitable for surfaces receiving medium- or heavy-textured finishes before painting or heavy wallcoverings where lighting conditions are not critical.
4. Level 3: [Where indicated on Drawings] <Insert locations>.
5. Level 4: [At panel surfaces that will be exposed to view unless otherwise indicated] <Insert locations>.
  - a. Primer and its application to surfaces are specified in Section 09 90 00 "Interior Painting."
6. Level 5: [Where indicated on Drawings] <Insert locations>.
  - a. Primer and its application to surfaces are specified in Section 09 90 00 "Interior Painting."

E. Glass-Mat Gypsum Sheathing Panel: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

### 3.8 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture[ matching approved mockup and] free of starved spots or other evidence of thin application or of application patterns.

- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

### **3.9 PROTECTION**

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION**

## SECTION 09 30 13

### CERAMIC TILE

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Provide tile where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 01410: Tile inspection services.

##### 1.2 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 23.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturers' specifications and other data needed to prove compliance with the specified requirements for:
    - a. Membrane;
    - b. Sealants;
    - c. Ceramic tile;
    - d. Grout;
    - e. Expanded metal lath and wire reinforcing;
    - f. Fasteners;
    - g. Additives.
- C. Samples: Accompanying the above submittal, provide Samples of:
  - 1. Ceramic tile:
    - a. Sufficient Samples of each size, color, and texture to demonstrate the maximum range of sizes, colors, textures, and flatness.
    - b. Tiles delivered to the job or installed in the Work, and which do not fall within the accepted range, shall be removed from the site and be replaced promptly with acceptable materials.
  - 2. Trim shapes and base: Each color, type, and shape.
  - 3. Marble thresholds: 300 mm (12") length of the specified material, shape, and finish.
- D. Certificates:
  - 1. Accompanying the above submittal, submit:
    - a. Manufacturer's certification that group materials being provided are suitable for the intended use, meet or exceed the referenced ANSI standards, and are listed on the "Tested Materials" list published by the Ceramic Tile Institute.
    - b. Friction test reports for floor tile.
  - 2. Prior to shipment of tile to the jobsite, deliver Master Grade Certificates to the Architect, complying with ANSI A137.1 or CTI 69.5 for special purpose tiles.

### 1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- B. Applicable standards: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this Specification to the extent they are specified herein. Unless otherwise specified, use the latest edition.
1. Federal Specifications:
    - a. TT-S-00227e, "Sealing Compound, Rubber Base, Two Component (For Calking, Sealing, and Glazing in Building Construction)";
    - b. TT-S-00230c, "Sealing Compound, Synthetic Rubber Base, Single Component Chemically Curing (For Calking, Sealing, and Glazing in Building Construction)";
    - c. TT-S-001543a, "Sealing Compound, Silicone Rubber Base (For Calking, Sealing, and Glazing in Buildings and Other Structures)".
  2. American Society for Testing and Materials (ASTM):
    - a. A18454, "Steel Welded Wire Fabric, Plain, for Concrete Reinforcement";
    - b. C144, "Aggregate for Masonry Mortar";
    - c. C150, "Portland Cement";
    - d. C206, "Finishing Hydrated Lime";
    - e. C207, "Hydrated Lime for Masonry Purposes";
    - f. C1026, "Measuring Frost Resistance of Ceramic Tile to Freeze-Thaw Cycling";
    - g. C1027, "Determining Visible Abrasion Resistance of Glazed Ceramic Tile";
    - h. C1028, "Evaluating the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method";
    - i. D226, "Asphalt Saturated Organic Felt Used in Roofing and Waterproofing".
    - j. D2103, "Polyethylene Film and Sheet";
  3. American National Standards Institute (ANSI):
    - a. A108.1, "Installation of Ceramic Tile with Portland Cement Mortar";
    - b. A108.4, "Installation of Ceramic Tile with Water Resistant Organic Adhesives";
    - c. A108.5, "Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar";
    - d. A108.6, "Installation of Ceramic Tile with Chemical Resistant Water Cleanable Tile Setting and Grouting Expxy";
    - e. A108.7, "Electrically Conductive Ceramic Tile Installed with Conductive Dry-Set Portland Cement Mortar";
    - f. A108.8, "Standard Specification for Installation of Ceramic Tile with Chemical Resistant Furan Mortars and Grouts";
    - g. A108.9, "Standard Specification for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortars and Grouts";
    - h. A108.10, "Standard Specification for Installation of Grout in Ceramic Tile Installations";
    - i. A118.1, "Dry-Set Portland Cement Mortar";
    - j. A118.2, "Conductive Dry-Set Mortar";
    - k. A118.3, "Chemical Resistant Water Cleanable Tile Setting and Grouting Epoxy";
    - l. A118.4, "Latex-Portland Cement Mortar";
    - m. A118.5, "Standard Specification for Chemical Resistant Furan Mortars and Grouts";
    - n. A118.6, "Standard Specification for Ceramic Tile Grouts";
    - o. A118.8, "Standard Specification for Modified Epoxy Emulsion Mortars and Grouts";
    - p. A136, "Organic Adhesives for Installation of Ceramic Tile";
    - q. A137.1, "American National Standard Specification for Ceramic Tile".
  4. Ceramic Tile Institute:
    - a. "Standards of the Tile Trade";
    - b. CTI 69-5, "Special Purpose Tile";
    - c. CTI TM-68, "Tested Materials".

- D. Acceptable products: Except as may be specified otherwise, use only such products as have been tested and listed by the Ceramic Tile Institute in its "Tested Materials" list.
- E. Pre-tiling meeting:
  - 1. Prior to commencing the work of this Section, schedule and attend a meeting at the jobsite to discuss conformance with requirements of the Contract Documents.
  - 2. Request attendance of representatives from:
    - a. Owner;
    - b. Architect;
    - c. Contractor;
    - d. Tile subcontractor;
    - e. Other parties who are involved.
- F. Blending:
  - 1. Require the tile manufacturer to blend tiles at the factory.
  - 2. Provide additional blending at the job site as needed to secure the Architect's approval.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 65 00.
- B. Provide only tile cartons which have been grade-sealed by the manufacturer in accordance with ANSI A137.1, and with grade-seals unbroken.
- C. On manufactured grouts, provide labels certifying compliance with the referenced standards.
- D. Wax:
  - 1. Wax may be applied to the face of units either by the manufacturer or the installer.
  - 2. After such coating has been applied, handle and store in a manner keeping wax off sides and backs of units.
  - 3. Units may be stacked, after waxing, back-to-back or face-to-face, but never waxed-surface to unwaxed-surface.

#### **1.5 SITE CONDITIONS**

- A. Install mortar, and set and grout the tile, only when temperature is at least 10 degrees C (50°F) and rising.
- B. Protection:
  - 1. Protect adjacent surfaces during progress of the work of this Section.
  - 2. Close rooms and spaces to traffic of all types until mortar and grout have set for 72 hours.
- C. Shade the work area from direct sunlight during the installation as needed to prevent rapid evaporation caused by excessive heat.
- D. Observe the manufacturer's recommended safety precautions, including those pertaining to ventilation.
- E. Illuminate the work area during installation, providing the same level and angle of illumination as will be available for final inspection.

#### **1.6 MAINTENANCE**

- A. Upon completion of the work of this Section, deliver to the Owner additional tile and trim shapes of each type, color, pattern, and size used in the Work, for the Owner's use in replacement and maintenance, at the rate of 3% of the amount used in the Work, packaged securely to prevent damage and clearly labeled.

## **PART 2 - PRODUCTS**

### **2.1 CERAMIC TILE**

- A. Except as may be otherwise specified or approved in advance by the Architect, provide floor tiles with coefficient of friction of 0.60 or higher in accordance with pertinent provisions of ASTM C1028.
- B. Except as otherwise approved in advance by the Architect, provide the following where called for on the Drawings.
  - 1. Floor tile at toilet.  
Vendor/manufacturer: Daltile  
Type: Unglazed 2" x 2" mosaic  
a. Keystones Group 3 for Field tile.  
  
Color: To be selected
  - 2. Base at toilet room/ locker and shower areas  
Type: Coved  
Color: To be selected.
  - 3. Walls at toilet room/ locker and shower areas  
Vendor/manufacturer: Daltile  
Type: 4 1/4" x 4 1/4" - semi gloss- 'Crystaltex'.
    - a. General  
4 1/4" x 4 1/4" - semi gloss- 'Crystaltex'.  
Group 2
    - b. Accent  
2" x 2" mosaic glazed - 'Permatones' in checkered pattern- (two color variation) Refer to interior elevations for location and pattern.  
Grout lines shall line up with general field tile.
- C. Provide standard trim shapes as required.
  - 1. Provide all bases, caps, stops, returns, trimmers, and other shapes indicated or required to produce a completely finished installation.
  - 2. Except as may be shown otherwise on the Drawings, provide color and finish matching the adjacent tile.

### **2.2 THRESHOLDS**

- A. At toilet rooms, provide marble thresholds complying with "Class A" of the Marble Institute of America, in color selected by the Architect from standard colors of the approved manufacturer, shaped to provide a comfortable transition between tile and other floor finishes, in the dimensions and thickness shown on the Drawings or otherwise approved by the Architect, and with smooth matte surface finish.

### **2.3 INSTALLATION MATERIALS**

**All Tile setting materials and accessories shall be based on products of:  
Laticrete International, Inc. Refer to specifications section 09305**

- A. Installation Specification:
  - 1. Floor tile: ANSI A108.1A and ANSI A118.1 or A881.4 (for slab on grade)
  - 2. Wall tile: ANSI A108.1A or A118.1
  - 3. Grout: ANSI A108.10



4. Epoxy Grout: ANSI A108.6
5. Water resistant gypsum board: ASTM C-630.

- B. Expansion/control joint sealant: Provide in colors selected by the Architect.
  1. Required interior: 24' in each direction, width 1/4" minimum. At joints between floors and walls, and at perimeter of metal door frames, provide one-part silicone material.
- C. Edge strips:
  1. Finish self edge ceramic tile or trim.

## 2.4 BONDING MORTARS

- A. Portland cement mortar (at all second-floor toilets, second-floor balcony, and deck area floors):
  1. Provide a mixture of Portland cement and sand, roughly in proportions of 1.5 for floors, and of Portland cement, sand and lime in proportions of 1:5:1/2 to 1:7:1 for walls.
  2. Comply with ANSI A108.1A or A108.1B.
  3. Provide proper reinforcing wire mesh and waterproofing membrane for a complete approved installation.
- B. Thin Set
  1. Provide latex portland cement mortar. Portland cement, extra fine sand, and special latex additive for use as a bond coat for setting tile.
  2. Comply with ANSI A118.4, and ANSI A108.1A.
- C. Water proof membrane liquid membrane with integral reinforcing fabric – Comply with ANSI A 118.10
- D. Special tile setting mortars will be considered by the Architect when complete technical data is submitted in advance.

## 2.5 GROUT

- A. Provide grout in colors selected by the architect from standard colors available from the approved manufacturer.
- B. Commercial Epoxy Grout : (ANSI A118.3) at Kitchen at Toilet room floors
  1. Provide a commercially grade non-sag formula.

## 2.6 OTHER MATERIALS

- A. Sealer:
  1. Over all the finished work of this Section, provide a sealer listed in the "Tested Materials" list of the Ceramic Tile Institute, and applied in strict accordance with the manufacturer's recommendations.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Coordinate with other trades as needed to assure that proper substrata are provided to receive

the work of this Section.

- C. Where a Portland cement mortar setting bed will be installed, do not commence installation of the setting bed until substrata are within the following tolerances:
  - 1. Horizontal surfaces: Level within 6 mm in 3 m (1/4" in ten ft. ) in all directions;
  - 2. Vertical surfaces: Plumb within 6 mm in 2.4 m (1/4" in eight ft.) In all directions.
- D. Where tile units will be thin-set directly to the substrata, do not commence installation of the tile units until substrata are within the following tolerances:
  - 1. Horizontal surfaces: Level within 3 mm in 3 m (1/8" in ten ft.) in all directions;
  - 2. Vertical surfaces: Plumb within 3 mm in 2.4 m (1/8" in eight ft.) In all directions.
- E. Condition of surfaces to receive tile:
  - 1. Verify that surfaces to receive mortar setting bed and tile are firm, dry, clean, and free from oily or waxy films and curing compounds.
  - 2. Verify that grounds, anchors, plugs, recess frames, bucks, electrical work, mechanical work, and similar items in or behind the tile have been installed before proceeding with installation of mortar bed or tile.

### 3.2 SUBSTRATA AND SETTING BEDS

- A. General:
  - 1. Comply with pertinent provisions of the referenced standards, except as otherwise directed by the Architect or specified herein.
  - 2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.
- B. Provide cleavage membranes, waterproof membranes, and setting beds as called for on the Drawings or specified herein.
  - 1. Install membranes in strict accordance with the manufacturers' recommendations.
  - 2. Where such items are not specifically called for on the Drawings, but are required for a complete and proper installation, notify the Architect and provide as directed.
- C. Do not install tile floors over membrane until the membrane has been tested and accepted.

### 3.3 INSTALLING TILE

- A. General:
  - 1. Comply with pertinent provisions of the referenced standards, except as otherwise directed by the Architect or specified herein.
  - 2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.
  - 3. Do not install tile floors over membrane until the membrane has been tested and accepted.
  - 4. Mix and use proprietary materials in strict accordance with the manufacturers' printed instructions.
  - 5. Prepare the surfaces, set fit, grout, and clean the work of this Section in strict accordance with the referenced standards and the manufacturers' recommendations.
- B. Install in accordance with pertinent provisions of the standards listed under "Quality Assurance" in Part One of this Section, pressing and beating tile into place to obtain 100% coverage by mortar on the back of each tile. Back-butter the tiles if necessary to achieve 100% coverage.
- C. Limits of tile:
  - 1. Extend tile into recesses and under equipment and fixtures to form complete covering without interruptions.
  - 2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or

joint alignment.

**D. Joining pattern:**

1. Lay tile in grid pattern unless otherwise indicated on the Drawings or directed by the Architect.
2. Align joints when adjoining tiles on floor, base, trim, and walls are the same size.
3. Layout tile work, and center the tile fields both directions in each space or on each wall area.
4. Adjust to minimize tile cutting.
5. Provide uniform joint widths.

**E. Allowable variations in finished work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes, and alignments shown:**

1. Horizontal surfaces: 3 mm in 3 m (1/8" in ten ft.) in all directions;
2. Vertical surfaces: 3 mm in 2.4 m (1/8" in eight ft.) in all directions.

### **3.4 EXPANSION/CONTROL JOINTS**

**A. Provide expansion/control joints where indicated on the Drawings, and:**

1. Interior: 7.2 m to 10.8 m (24'-0" to 36'-0") in each direction;
2. Exterior: 3.6 m to 4.8 m (12'-0" to 16'-0") in each direction;
3. Interior tile work exposed to direct sunlight or moisture: 3.6 m to 4/8 m (12'-0" to 16'-0") in each direction;
4. Where tile abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes ceilings, and where changes occur in backing materials;
5. At perimeter walls in rooms and spaces larger than 3.6 m (12 ft.) On one side;
6. As continuation of expansion joints, control joints, cold joints, and seismic joints in the building structure which occur in tiled areas, making such joints in the tile work not less in width than the joint which is being continued.

**B. Verify exact locations of joints with the Architect at the pre-tiling meeting described in Part 1 of this Section.**

**C. Extend openings for joints completely through the tile, mortar, mortar bed, and reinforcing.**

1. Make openings for joints the same width as the tile joints.
2. Keep joints open and free from mortar and grout until filled with sealant.
3. Apply joint primer in all wet areas, and apply elsewhere as recommended by the sealant manufacturer.
4. Make joint edges free from dirt, oils, wax, and other contaminants.

**D. Seal between tile and penetration and restraining surfaces with sealant matching the color of grout/joint filler.**

**E. Perform sealant installation in accordance with pertinent provisions of Section 07920 of these Specifications.**

### **3.5 THRESHOLDS**

**A. Edge strips:**

1. Install edge strips at openings where threshold has not been called for, but where tile floor abuts other flooring material at same level.

**B. Marble thresholds:**

1. Install marble thresholds where shown on the Drawings, using materials and methods specified for installing tile.

**C. Where thresholds are detailed to be installed over tile, install with a full bedding of bonding mortar.**

### **3.6 GROUTING**

#### **A. General:**

1. Do not begin grouting floor tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed.
2. Remove spacers, ropes, glue, and similar foreign matter prior to grouting.
3. When using proprietary grout, adhere strictly to the manufacturer's directions unless otherwise specified or approved in advance by the Architect.

#### **B. Installation:**

1. Mix grout by hand or with a slow-speed drill motor not exceeding 300 rpm, achieving a stiff non-slumping consistency, and using the minimum amount of liquid to achieve a workable mix.
2. Force the maximum amount of the approved grout into joints in accordance with pertinent recommendations contained in ANSI A108.10.
3. Fill the joints of cushion-edge tile to depth of the cushion; fill joints of square-edge tile flush with the surface.
4. Fill all gaps and skips.
  - a. Do not permit mortar or mounting mesh to show through grouted joints.
  - b. Provide hard finished grout which is uniform in color, smooth, and without voids, pin holes, or low spots.
  - c. Leave tile clean.

### **3.7 CURING**

#### **A. Damp cure all tile installations, including Portland cement grouts, for 72 hours minimum.**

1. Cover with 18 kg (40 lb) kraft paper.
2. Do not use polyethylene sheets directly over tile on horizontal surfaces.

### **3.8 CLEANING AND POLISHING**

#### **A. After completion of setting and grouting, thoroughly clean and polish the tile.**

1. Do not use acid or acid cleaners to clean tile.
2. When the tile is thoroughly clean and dry, polish glazed tile with clean dry cloths.

### **3.9 REPLACEMENT**

#### **A. Replace cracked, chipped, broken, and otherwise defective tiles.**

#### **B. Remove work not complying with requirements of the Contract Documents or the referenced standards, and promptly replace with work which does comply.**

### **END OF SECTION**

## **SECTION 09 51 00**

### **ACOUSTICAL CEILING SUSPENSIONS ASSEMBLIES**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Supplementary acoustical insulation above ceiling.

##### **1.02 RELATED SECTIONS**

- A. Section 07 21 00 – Building Insulation: Acoustical insulation.
- B. Section 07 92 00 - Joint Sealers: Acoustical sealant.
- C. Section 08 31 00 - Access Doors and Panels: Access panels.
- D. Mechanical
- E. Electrical

##### **1.03 REFERENCES**

- A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2004.
- B. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2004.
- C. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2001.
- D. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2002.
- E. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 1998 (Reapproved 2005).
- F. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- G. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

##### **1.04 SUBMITTALS**

- A. See Section 01 33 23 – Submittal and Substitutions, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
- C. Product Data: Provide data on suspension system components.
- D. Samples: Submit two samples 6 x 6 inches in size illustrating material and finish of acoustical units.

- E. Samples: Submit two full size samples illustrating material and finish of acoustical units.
- F. Samples: Submit two samples each, 12 inches long, of suspension system main runner.
- G. Manufacturer's Installation Instructions: Indicate special procedures.

#### **1.04.1 QUALITY ASSURANCE**

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

#### **1.04.2 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

#### **1.04.3 PROJECT CONDITIONS**

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

#### **1.04.4 EXTRA MATERIALS**

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide 5 sq ft of each type of acoustical unit for Owner's use in maintenance of project.
- C. Provide 5 percent of total acoustical unit area of each type of acoustical unit for Owner's use in maintenance of project.

### **PART 2 - PRODUCTS**

#### **2.01 ACOUSTICAL UNITS**

- A. Manufacturers:
  1. Armstrong World Industries, Inc., - [www.armstrong.com](http://www.armstrong.com).  
2500 Columbia Ave. (17603)  
P.O. Box 3001  
Lancaster, PA 17604  
Tel: 717-397-0611
  2. USG - [www.usg.com](http://www.usg.com)
  3. Substitutions: See Section 01 33 23
- B. Ceiling System:
  1. Type 1: Armstrong – 2' x 2' Standard 'T' Bar System
  2. Type 2: Armstrong – Suspended 'T' Bar Drywall Ceiling
- C. Acoustical Tile, **Type 1**: Mineral fiber, ASTM E 1264 Type III, Class A  
Armstrong Optima – Open plan tegular, # 3251, with the following characteristics:

1. Size: 24 x 24 inches (600 x 600 mm)
2. Thickness: 1 inch (25 mm).
3. Class: A, flame spread 25 or under (UL labeled), per ASTM E1264
4. Light Reflectance: 90 percent, determined as specified in ASTM E 1264.
5. NRC Range: 0.70 determined as specified in ASTM E 1264.
6. Articulation Class (AC): A, determined as specified in ASTM E 1264.
7. Ceiling Attenuation Class (CAC): 40, determined as specified in ASTM E 1264.
8. Joint: Kerfed and rabbeted.
9. Edge: Square Tegral
10. Surface Color: White.
11. Product: # 3251 by Armstrong.
12. Suspension System: Type 1: Exposed 9/16" tee.

D. Acoustical Units - General: ASTM E 1264, Class A.

## 2.02 SUSPENSION SYSTEM(S)

### A. Manufacturers:

1. Same as for acoustical units.
2. Armstrong World Industries, Inc; Product Exposed T-Grid: [www.armstrong.com](http://www.armstrong.com).
3. Chicago Metallic Corporation; Equal Product: [www.chicagometallic.com](http://www.chicagometallic.com).
4. Substitutions: See Section 01 33 23

B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

1. Type 1:
  - Interlude Sonata – 9/16" Grid
2. Type 2:
  - Drywall Suspended Ceiling System

## 2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.

1. At Exposed Grid:
  - a. Provide L-shaped molding for mounting at same elevation as face of grid.
  - b. Provide Shadow molding where indicated on the drawings.
  - b. Provide custom perimeter trim where shown on the drawings.
  - c. Provide 'C' channel where recessed window shades (Mecho shade) occurs –  
- See drawings

C. Acoustical Insulation: Specified in Section 07212.

1. Thickness: 2 inch (50 mm).
2. Size: To fit acoustical suspension system.

D. Gypsum Board: Fire rated type; 5/8 inch (15 mm) thick, ends and edges square, paper faced.

E. Acoustical Sealant For Perimeter Moldings: Specified in Section 07900.

F. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.

G. Touch-up Paint: Type and color to match acoustical and grid units.

## **2.04 CUSTOM PERIMETER TRIM**

- A. Product/Manufacturer: Axiom - Interlude Custom Perimeter Trim; Armstrong World Industries, Inc.
- B. Components: Edge trim system that compliments the unique Armstrong Interlude grid system visual (full panel installations only), 10 foot sections, extruded aluminum alloy 6063 trim channel, factory-finished in (factory-applied baked polyester paint to match Armstrong) (WH) color.
  - 1. Axiom Interlude Trim Channel: (2") (4") (6") extruded aluminum with special bosses formed for attachment to the Axiom tee-bar connection clip or hanging clip.
    - a. AXLD2STR – Axiom Interlude 2" straight
    - b. AXLD4STR – Axiom Interlude 4" straight
    - c. AXLD6STR – Axiom Interlude 6" straight
  - 2. Axiom Interlude Outside Corners (Straight Only): Commercial quality extruded aluminum sections formed to match the Axiom trim channel profile; pre-assembled with built-in splice plates that connect to straight Axiom sections; 12 inch x 3/4 inch x (2") (4") (6"); factory-finished in (factory-applied baked polyester paint to match Armstrong) ( ) color; (architectural film textured finish), (color custom paint finish color-matched to approved sample).
    - a. AXLD2QSOS – 2" Axiom Interlude Outside Corner
    - b. AXLD4QSOS – 4" Axiom Interlude Outside Corner
    - c. AXLD6QSOS – 6" Axiom Interlude Outside Corner
  - 3. Axiom Interlude Inside Corners (Straight Only): Commercial quality extruded aluminum sections formed to match the Axiom trim channel profile that connect to straight Axiom sections, 12 inch x 3/4 inch x (2") (4") (6") factory-finished in (factory-applied baked polyester paint to match Armstrong) ( ) color; (architectural film textured finish), (color custom paint finish color-matched to approved sample).
    - a. AXLD2QSI – 2" Axiom Interlude Inside Corner
    - b. AXLD4QSI – 4" Axiom Interlude Inside Corner
    - c. AXLD6QSI – 6" Axiom Interlude Inside Corner
  - 4. Accessories:
    - a. AXHGC – Hanging clip, commercial quality aluminum, unfinished, used to align grid members that extend beyond the lower edge of the trim.
    - b. AX2HGC – Hanging clip, commercial quality aluminum, unfinished, used when suspension wires must be attached directly to the trim sections.
    - c. AXSPICE – Splice with set screws, galvanized steel, unfinished, used to attached factory-mitered inside corners
    - d. AX4SPICE – Splice with set screws, galvanized steel, unfinished, used to attach joints between sections of trim.
    - e. IES3 – Interlude Expansion Sleeve

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

### **3.02 INSTALLATION - SUSPENSION SYSTEM**

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.



- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Locate system on room axis according to reflected plan.
- E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- F. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- G. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- H. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- I. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- J. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.
- K. Do not eccentrically load system or induce rotation of runners.
- L. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
  - 1. Install with continuous gasket.
  - 2. Use longest practical lengths.
  - 3. Overlap and rivet corners.
- M. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch (25 mm) movement. Maintain visual closure.
- N. Install light fixture boxes constructed of gypsum board above light fixtures in accordance with fire rated assembly requirements and light fixture ventilation requirements.

### **3.03 INSTALLATION - ACOUSTICAL UNITS**

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical unit level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
  - 1. Cut to fit irregular grid and perimeter edge trim.
  - 2. Make field cut edges of same profile as factory edges.
  - 3. Double cut and field paint exposed reveal edges.

- 4. Where round obstructions occur, provide preformed closures to match perimeter molding.
- H. Lay acoustical insulation for a distance of 48 inches (1 200 mm) either side of acoustical partitions as indicated.
- I. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.
- J. Install hold-down clips on panels within 20 ft (6 m) of an exterior door.

#### **3.04 ERECTION TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

**END OF SECTION**

**SECTION 09 65 00**  
**RESILIENT FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED SECTIONS**

- A. Section 03505 - Self-Leveling Underlayment.

**1.03 REFERENCES**

- A. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2006.
- B. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2005.
- C. ASTM F 1066 - Standard Specification for Vinyl Composition Floor Tile; 2004.
- D. ASTM F 1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing; 2004.
- E. ASTM F 1344 - Standard Specification for Rubber Floor Tile; 2004.
- F. ASTM F 1700 - Standard Specification for Solid Vinyl Floor Tile; 2004.
- G. ASTM F 1861 - Standard Specification for Resilient Wall Base; 2002.
- H. ASTM F 1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004.
- I. ASTM F 2034 - Standard Specification for Sheet Linoleum Floor Covering; 2003.
- J. ASTM F 2195 - Standard Specification for Linoleum Floor Tile; 2003.
- K. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; [www.baaqmd.gov](http://www.baaqmd.gov); current edition.
- L. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant; Federal Specifications and Standards; Revision E, 1994.
- M. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2006.
- N. RFCI - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; 1998.
- O. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).

**1.04 SUBMITTALS**

- A. See Section 01 33 23 - Submittal and Substitutions, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

- C. Shop Drawings: Indicate seaming plan.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Design Professional's initial selection.
- E. Verification Samples: Submit two samples, 12 x 12 inch in size illustrating color and pattern for each resilient flooring product specified.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. LEED Report: Report recycled content and VOC emission of flooring; VOC content of adhesives.
  - 1. For linoleum flooring, report rapidly-renewable content and urea-formaldehyde content.

#### **1.05 DELIVERY, STORAGE, AND PROTECTION**

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

#### **1.06 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

#### **1.07 EXTRA MATERIALS**

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide 5% of flooring, 10 lineal feet of base, and installed materials of each type and color specified.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS - TILE FLOORING**

- A. Vinyl Tile: Solid vinyl with color and pattern throughout thickness, and:
  - 1. Minimum Requirements: Comply with ASTM F1700, Class corresponding to type specified.
  - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
  - 3. Size: 13 x 13 inch
  - 4. Wear Layer Thickness: 0.020 inch (0.50 mm).
  - 5. Total Thickness: 0.100 inch (2.5 mm).
  - 6. Pattern: Forbo – Marmoleum Dual
  - 7. Color: To be selected.
  - 8. Manufacturers:
    - Forbo Flooring: Marmoleum Dual. [www.forbo.com](http://www.forbo.com)
    - or Approved equal product by one of the following:
      - a. Flexco, Inc; Product: Solid Vinyl Tile: [www.flexcofloors.com](http://www.flexcofloors.com).
      - b. Roppe, [www.roppe.com](http://www.roppe.com).
      - c. Substitutions: See Section 01600 - Product Requirements.

#### **2.02 MATERIALS - BASE**

- A. Resilient Base: ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
  - 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
  - 2. Height: 4 inch (100 mm) and 2 inch (50mm) where indicated on the drawings.

3. Thickness: 0.125 inch (3.2 mm) thick.
4. Finish: Satin.
5. Length: 4 foot (1.2 m) sections, where indicated on the finish schedule.
6. Length: Roll.
7. Color: Color as selected from manufacturer's standards.
8. Accessories: Premolded external corners and end stops.
9. Manufacturers:
  - a. BurkeMercer Flooring Products; [www.burkemercer.com](http://www.burkemercer.com).
  - b. Johnsonite, Inc; [www.johnsonite.com](http://www.johnsonite.com).
  - c. Substitutions: See Section 01600 - Product Requirements.

### **2.03 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
  1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
- C. Moldings and Edge Strips: Vinyl
  1. Product: Carpet to vinyl tile transition piece manufactured by Johnsonite. Color: To be selected.
- D. Filler for Coved Base: Plastic.
- E. Sealer and Wax: Types recommended by flooring manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- E. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
  1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft (7.1 kg per 100 sq m) per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
  2. Alkalinity: pH range of 5-9.
- F. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed. Apply primer to concrete surfaces.

### **3.03 INSTALLATION - TILE FLOORING**

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- F. Install tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- G. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- H. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. After installation of flooring, secure metal strips with stainless steel screws.
- I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- J. Install flooring in recessed floor access covers. Maintain floor pattern.
- K. At movable partitions, install flooring under partitions without interrupting floor pattern.
- L. Install feature strips and floor markings where indicated. Fit joints tightly.

### **3.04 INSTALLATION - BASE**

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### **3.05 CLEANING**

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

### **3.06 PROTECTION OF FINISHED WORK**

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

**END OF SECTION**

**SECTION 09 67 23**  
**RESILIENT FLOORING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included: Provide and install multi-part epoxy resin floor system, complete, as shown on Drawings and as specified, including:
  - 1. Locations: Areas as indicated by the Plan finish schedule.
  - 2. Provide preparation of substrate as recommended by the resinous flooring manufacturer.
  - 3. Provide and install cove base with trims and accessories as specified in this Section.
  - 4. Provide and install multi-part resinous floor system as specified in this Section.
  - 5. Provide and install sealant joint material for the Work of this Section as specified in this Section.
  - 6. Provide treatment of substrate cracks and control/construction joints as needed and specified in this Section.
- B. Related Work Specified Elsewhere:
  - 1. Division 01 81 13 – Sustainable Design Requirements
  - 2. Division 03 30 00 – Cast-In-Place Concrete
  - 3. Division 07 10 00 – Dampproofing and Waterproofing
  - 4. Division 07 90 00 – Joint Protection

**1.2 SUBMITTALS**

- A. Comply with provisions of Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's technical data, installation instructions, and general recommendations for each resinous flooring material required.
  - 1. Include certification that indicates compliance of materials with requirements.
- C. Samples: Submit, for verification purposes, 5-inch square samples of each type of resinous flooring required, applied to a rigid backing, in color and finish indicated.
  - 1. For initial selection of colors and finishes, submit manufacturer's color charts showing full range of colors and finishes available.
- D. Certificates: By manufacturer of resinous flooring; upon completion of Work, written statement that technical support to applicator and field supervision was sufficient to assure proper application of materials and that installation is acceptable.
- E. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.

### **1.3 QUALITY ASSURANCE**

- A. Qualifications of the Applicator: Licensed or approved by the manufacturer of the coating system and has successfully completed 5 projects of similar size and complexity.
- B. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing and installing principal materials described in this Section.
- C. Special Requirements: Regulatory Agencies: Use materials for Work of this Section which comply with volatile organic compound limitations and other regulations of local Air Quality Management District and other local, state, and federal agencies having jurisdiction.
- D. ISO 9001: All materials, including primers, resins, curing agents, finish coats, aggregates and sealants are manufactured and tested under an ISO 9001 registered quality system.

### **1.4 PRE-INSTALLATION CONFERENCE**

- A. Comply with requirements of Section 01 31 19 – Project Meetings.
- B. Arrange a conference at the job site to coordinate resinous flooring and critical finish systems, to be attended by the General Contractor, Architect/Owner's Representative and personnel involved in the actual manufacture as well as the installation of the Work in this Section and of the following Sections:
  - 1. Section 03 30 00 – Cast-In-Place Concrete
  - 2. Section 06 41 00 – Architectural Wood Casework.
  - 3. Section 07 42 00 – Wall Panels

### **1.5 PROJECT CONDITIONS**

- A. Type 1 concrete shall be properly cured for a minimum of 30 days. Type III concrete shall be properly cured for a minimum of 7 days. A vapor barrier must be present for concrete substrates on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring.
- B. Utilities, including electric, water, heat (air temperature between 60 and 85°F/16 and 30°C) and finished lighting to be supplied by General Contractor.
- C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

### **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Material shall be delivered to job site and checked by flooring contractor for completeness and shipping damage prior to job start.
- B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors.
  - 1. No on site weighing or volumetric measurements allowed.
- C. Material shall be stored in a dry, enclosed area protected from exposure to moisture.
  - 1. Temperature of storage area shall be maintained between 60 and 85-degrees F.



## 1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) one full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) one full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.
  - 1. Resinous manufacturer representative shall return to project within 6 months to conduct inspection of resinous floor area.

## PART 2 - PRODUCTS

### 2.1 RESINOUS FLOORING

- A. Colors:
  - 1. As selected by Architect from manufacturer's standard colors.
- B. Resinous Flooring
  - 1. Basis of Design: Stonclad GS with Stonkote GS4/ GS6 flat, total minimum thickness of 1/4", is comprised of a penetrating two component epoxy primer, high performance, three-component mortar consisting of epoxy resin, curing agent, selected, graded aggregates blended with inorganic pigments and a two-component, epoxy finish sealer as manufactured and installed by Stonhard, Contact: Jeremy Mendelson, ph 619-886-4265, [gmendelson@stonhard.com](mailto:gmendelson@stonhard.com)
- C. System Components: Manufacturer's standard components that are compatible with each other and are as follows:
  - 1. Epoxy Primer (Standard Primer): A two-component epoxy primer.
  - 2. Mortar Base (Stonclad GS):
    - a. Resin: Amine-cured Epoxy
    - b. Formulation Description: Three-component mortar consisting of epoxy resin, curing agent, selected, graded aggregates blended with inorganic pigments.
    - c. Type: Pigmented mortar
    - d. Application Method: Steel trowel
    - e. Application thickness: 1/4" minimum
- A. (RF-1) Pigmented glossy Sealer (Stonkote GS4):
  - 1. Resin: 100% Solids Epoxy
  - 2. Formulation Description: Two component, free flowing epoxy formulation consisting of resin and curing agent.
  - 3. Type: Pigmented
  - 4. Application Method: Squeegee and medium nap roller
  - 5. Application thickness: 4-5 mils
  - 6. Finish: Gloss
  - 7. Number of Coats: 1, 2 for "Silver Gray" color.
- B. (RF-2) Pigmented Matte Sealer (GS-6)
  - 1. Resin: 100% polyurethane

2. Formulation Description: Two component, high performance aliphatic polyurethane consisting of a resin and curing agent
3. Type: clear flat
4. Application Method: medium nap roller or brush
5. Application thickness: 2-5 mils
6. Finish: Flat
7. Number of coats: 1

**D. Expansion/Isolation Joint Sealant Materials:**

1. Stonflex MP7: Two-component, pourable polyurethane sealant with a minimum 400% percent elongation per ASTM D-638.
2. Backer Rod: Polyurethane foam rod or polyethylene backer rod one grade larger than the joint width.

**E. Dynamic Cracks, Control and Construction Joints (if needed):**

1. Stonproof CT5: Two-component, flexibilized epoxy membrane in conjunction with 10 ounce fiberglass engineering fabric.

**F. Integral Coved Base:**

1. Stonclad GS with Stonkote GS4 finish sealer: Three-component, epoxy mortar with two-component finish sealer applied to the height indicated on Drawings and Finish Schedule.
2. Radius at floor/wall interface shall be at a  $\frac{3}{4}$ " minimum.
3. Metal Cove Termination Strip:  $\frac{1}{8}$ " x  $\frac{1}{2}$ ", "L" shaped, zinc or equivalent metal, cove strip fastened to wall substrate at cove height indicated on Drawings.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

**A. General:** Examine substrate to receive resinous flooring; give written notification of deficiencies. Do not proceed until unsatisfactory conditions are corrected.

1. Substrate must be dry and free of all wax, grease, oils, fats, soil, loose or foreign materials and laitance.
  - a. Laitance and unbonded cement particles must be removed by abrasive blasting, scarifying.
  - b. Other contaminants may be removed by scrubbing with a heavy-duty industrial detergent, "Stonkleen DG9", or equal; and rinsing with clean water.
  - c. The surface must show open pores throughout and have a sandpaper texture.

**B. Moisture Testing:** Test horizontal substrates to determine acceptable dryness. Test method as recommended by resinous flooring manufacturer.

1. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 85 percent.
2. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 6 lb per 1,000 sq. ft. per 24 hours.
3. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

### 3.2 PREPARATION

- A. Surface Preparation: Concrete preparation shall be by mechanical means and include use of a scabbler, scarifier or shot blast machine for removal of bond inhibiting materials such as curing compounds or laitance.

### 3.3 MIXING

- A. General: Mix components only in amounts that can be applied within recommended application life.
  - 1. Discard materials not used within application life.

### 3.4 SYSTEM APPLICATION

- A. General: Apply each component of resinous flooring system in compliance with manufacturer's written directions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted except at divider strips, sawn joints or other types of joints (if any), indicated or required.
- B. Resinous Flooring:
  - 1. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates. Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.
  - 2. Troweled Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate using manufacturer's specially designed screed rake adjusted to manufacturer's recommended height. Hand trowel apply mixed material over freshly primed substrate using steel finishing trowels or power trowel material using manufacturer's specially designed power trowel blades.
  - 3. Finish Sealer: Remove excess unbonded granules by lightly brushing and vacuuming the floor surface. Mix and apply coating with strict adherence to manufacturer's installation procedures to both floor and coved base surfaces.
- C. Integral Coved Base:
  - 1. Mix and apply cove base mortar in conjunction with mortar base of resinous flooring at the height indicated on Drawings and/or Finish Schedule.
- D. Expansion/Isolation Joints:
  - 1. Stonflex MP7 Sealant: Mix and apply sealant to properly prepared cut joints (if any). The use of a polyethylene backer rod should be used in expansion and/or isolation joints. Sealant shall be applied at a depth of half the width of the joint.
- E. Dynamic Cracks, Control and/or Construction Joints:
  - 1. Stonproof CT5: Prior to installation of Resinous Flooring, mechanically rout cracks and joints to a depth of 3/8" minimum and at a 45 degree angle to create a "V" into the concrete substrate following the crack and/or joint. Apply Stonproof CT5 at a 30 mil thickness six inches on each side of crack or joint and filling the "V". Immediately place 10 ounce woven fiberglass engineering fabric into uncured Stonproof CT5 and saturate with additional Stonproof CT5 applied with a medium nap roller.

### **3.5 FIELD QUALITY CONTROL**

- A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of flooring application.
  - 1. The Owner will engage service of an independent testing laboratory to sample materials being used on the job site. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
  - 2. Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.
  - 3. If test results show materials being used do not comply with specified requirements, Contractor may be directed by the Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

### **3.6 PROTECTION OF ADJACENT WORK**

- A. General: Resinous floor system will be installed in locations where other adjacent finish materials, including ornamental metal, lath and plaster, and other finish assemblies may already be in place. Protect all adjacent surfaces during installation and finishing.
  - 1. Installed adjacent finishes shall be completely isolated from epoxy coating system installation. Provide Plastic ("Visqueen") wrap and mask all edges.
  - 2. Provide constant supervision and immediate clean up throughout resinous floor system installation.
  - 3. After resinous floor system has fully cured, remove protection from adjacent surfaces and wipe down surfaces using clean, cotton towels.

### **3.7 CURING, PROTECTION AND CLEANING**

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.
  - 1. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation.
  - 1. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application.
  - 2. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning:
  - 1. Remove temporary covering and clean resinous flooring just prior to final inspection.
  - 2. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

**END OF SECTION**

## **SECTION 09 68 13**

### **TILE CARPETING**

#### **PART 1 – GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Carpet tile, loose laid with edges and control grid adhered.
- B. Removal of existing carpet tile.
- C. Matching roll carpet for direct glue installation on base.

##### **1.02 RELATED SECTIONS**

- A. Section 01 74 00 - Waste Management: Reclamation/Recycling of new carpet tile scrap

##### **1.03 ALLOWANCES**

- A. Section 01 21 00 - Allowances: Cash allowances affecting this section.

##### **1.04 REFERENCES**

- A. ASTM D 2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2004.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- C. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2006.
- D. CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials; Carpet and Rug Institute; 2002.
- E. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; [www.carpet-rug.org](http://www.carpet-rug.org); current edition.
- F. CRI (GLC) - Green Label Testing Program - Approved Product Categories for Carpet; [www.carpet-rug.org](http://www.carpet-rug.org); current edition.
- G. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; [www.carpet-rug.org](http://www.carpet-rug.org); current edition.
- H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2006.

##### **1.05 SUBMITTALS**

- A. See Section 01 33 23 - Submittal and Substitutions, for submittal procedures.
- B. Shop Drawings: Indicate layout of joints.
- C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit two, 12 inch long samples of edge strip.
- F. LEED Report: Submit data documenting VOC content of carpet tile and adhesives; copy of current CRI Approved Products Listing is acceptable.
- G. Manufacturer's Installation Instructions: Indicate special procedures.
- H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.

#### **1.07 ENVIRONMENTAL REQUIREMENTS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

#### **1.08 EXTRA MATERIALS**

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide two (2) of carpet tiles of each color and pattern selected.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Shaw Contract Group; Product: Knit
- B. Other Acceptable Manufacturers:
  1. Interface, Inc; [www.interfaceinc.com](http://www.interfaceinc.com).
  2. Milliken & Company; [www.milliken.com](http://www.milliken.com).
  3. Substitutions: See Section 01 33 23.

#### **2.02 MATERIALS**

- A. Carpet Tile Type I: Tufted, manufactured in one color dye lot.
  1. Product: Knit Tile, manufactured by Shaw Contract Group.
  2. Tile Size: 24" x 24" inch, nominal.
  3. Thickness: .242 inch.
  4. Construction: Multi-level pattern loop.
  5. Pattern: # 59492
  6. Surface Burning Characteristics: Flame spread/Smoke developed index of Class 1, maximum, when tested in accordance with ASTM E 84.
  7. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E 648 or NFPA 253.

8. Surface Flammability Ignition: Pass ASTM D 2859 (the "pill test").
9. VOC Content: Provide CRI Green Label Plus certified product; in lieu of labeling, independent test report showing compliance is acceptable.
10. Static Control Fiber: Permanent Conductive Fiber.
11. Max. Electrostatic Charge: 3 Kv. at 20 percent relative humidity.
12. Dye Method: 92% Solution-dyed / 8% Yarn-died.
13. Gage: 1/12 inch.
14. Stitches: 10.0 per inch.
15. Fiber: Eco Solution q<sup>R</sup> nylon
16. Flaming Mode: < 450
17. Warranty: Lifetime Commercial Limited
18. Primary Backing Material: Synthetic
19. Secondary Backing Material: Ecoworx.Tile
20. Tufted Weight: 28 oz/yd(2)
21. Protective treatment: ssp<sup>R</sup> shaw soil protection
22. Color: To be selected.

### **2.03 ACCESSORIES**

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Adhesives: Acceptable to carpet manufacturers, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for carpet tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet tile manufacturer and adhesive materials manufacturer.
- E. Verify that concrete sub-floor surfaces are ready for carpet tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
  1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft (7.1 kg per 100 sq m) per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
  2. Alkalinity: pH range of 5-9.
- F. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Remove existing carpet.

- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.

### **3.03 INSTALLATION**

- A. Install carpet tile in accordance with manufacturer's instructions and CRI 104.
- B. Blend carpet from different cartons to ensure minimal variation in color match.
- C. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- D. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- E. Locate change of color or pattern between rooms under door centerline.
- F. Adhere carpet tile to substrate along centerline of rooms, at perimeter of rooms, where tiles are cut, and at 15 foot (4.5 m) intervals throughout rooms. Lay remainder of tile dry over substrate.
- G. Adhere carpet tile as base finish up vertical surfaces to form base. Terminate top of base with cap strip.
- H. Trim carpet tile neatly at walls and around interruptions.
- I. Complete installation of edge strips, concealing exposed edges.

### **3.04 INSTALLATION ON STAIRS**

- A. Use one piece of carpet for each tread and the riser below. Apply seam adhesive to all cut edges.
- B. Lay carpet with pile direction in the length of the stair.
- C. Adhere carpet tight to stair treads and risers.

### **3.05 CLEANING**

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

**END OF SECTION**



## **SECTION 09 90 00**

### **PAINTING & COATING**

#### **PARTS 1 – GENERAL**

##### **1.01 SUMMARY:**

- A. Section Includes: Painting and finishing of all interior and exterior items and surfaces, unless otherwise indicated or listed under exclusions below:
  - 1. Paint all exposed surfaces, except as otherwise indicated, whether or not colors are designated. Include field painting of exposed exterior and interior plumbing, mechanical and electrical work, except as indicated below.
  - 2. Paint exterior stucco where indicated on Drawings.
- B. Work Included:
  - 1. The intent and requirements of this Section is that all work, items and surfaces which are normally painted and finished in a building of this type and quality, shall be so included in this contract, whether or not said work, item or surface is specifically called out and included in the schedules and notes on the drawings, or is, or is not, specifically mentioned in these specifications.
- C. The following general categories of work and items that are included under other sections shall not be a part of this section:
  - 1. Shop prime painting of structural and miscellaneous iron or steel.
  - 2. Shop prime painting of hollow metal work.
  - 3. Shop finished items.
- D. The Room Finish Schedules indicated on the drawings indicates the location of interior room surfaces to be painted or finished. The schedule indications are general and do not necessarily define the detail requirements. Include all detailed refinements and further instructions as may be given for the required complete finishing of all spaces and rooms.

##### **1.02 SUBMITTALS:**

- A. Product Data: Submit complete manufacturer's descriptive literature and specifications in accordance with the provisions of Section 01 33 23.
  - 1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item when applicable. When required, provide a list of paint and coating materials proposed for use, which equates such materials with the design-basis products specified.
- B. Samples: In accordance with provisions of Section 01 33 23, submit, on 8-1/2 inch by 11 inch hardboard, samples of each color, gloss, texture and material selected by the Architect from standard colors available for the coatings required.
  - 1. For natural and stained finishes, provide sample on each type and quality of wood used on the project.
- C. Manufacturer's Instructions: Submit the manufacturer's current recommended methods of installation, including relevant limitations, safety and environmental cautions, application rates, and composition analysis

##### **1.03 QUALITY ASSURANCE:**

- A. Regulatory Requirements: Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this Specification, comply with the more stringent provisions. Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to job going out to bid and before start of painting project.
  - a. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
  - b. Comply with South Coast Air Quality Management District (SCAQMD) Rule 1113. A copy of this regulation can be obtained from <http://www.aqmd.gov/rules/reg/reg11/r1113.pdf>.
- B. Field Sample: When and as directed by the Architect, apply one complete coating system for each color, gloss and texture required. When approved, the sample panel areas will be deemed incorporated into the Work and will serve as the standards by which the subsequent Work of this Section will be judged.

#### **1.04 DELIVERY, STORAGE, AND HANDLING:**

- A. Storage and Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.
- B. Deliver materials to job site in new, original, and unopened containers bearing manufacturer's name and trade name. Store where directed in accordance with manufacturer's instructions.

#### **1.05 PROJECT CONDITIONS:**

- A. Do not apply exterior materials during fog, rain or mist, or when inclement weather is expected within the dry time specified by the manufacturer. No exterior or interior painting shall be done until the surfaces are thoroughly dry and cured. Do not apply paint when temperature is below 50° F. Avoid painting surfaces when exposed to direct sunlight.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS:**

- A. Manufacturer's catalog names and number of paint types in this Section herein are based on products manufactured or distributed by the Dunn-Edwards Corporation [www.dunnedwards.com](http://www.dunnedwards.com) and are the basis of design against which the Architect will judge equivalency. The quantity of titanium dioxide, the use of clays, aluminum silicate, talc and the purity of acrylic materials are a few of the criteria which will be used by the Architect in determining equivalency of materials.
- B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01 33 23 Submittal and Substitutions. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.
- C. Acceptable Manufacturers
  - 1. Carboline [www.carboline.com](http://www.carboline.com)
  - 2. Deft [www.deftfinishes.com](http://www.deftfinishes.com)
  - 3. Dumond Chemicals [www.dumondchemicals.com](http://www.dumondchemicals.com)
  - 4. Okon [www.okoninc.com](http://www.okoninc.com)
  - 5. Rustoleum [www.rustoleumibg.com](http://www.rustoleumibg.com)
  - 6. Valspar [www.valsparwood.com](http://www.valsparwood.com)

## **2.02 MATERIALS:**

- A. **Paints:** Provide ready-mixed, except field catalyzed coatings. Pigments shall be fully ground maintaining soft paste consistency, capable of being readily and uniformly dispersed to complete homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of drying or curing free of streaks and sags.
- B. **Accessory Materials:** Linseed oil, shellac, solvents, and other materials not specified but required to achieve required finishes shall be of high quality and approved by manufacturer.
- C. **Colors** shall be selected from color chip samples provided by manufacturer of paint system approved for use. Match approved samples for color, texture and coverage.
- D. **Aromatic Compounds:** Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
- E. **Restricted Components:** Paints and coatings shall not contain any of the following.
  - 1. Acrolein.
  - 2. Acrylonitrile.
  - 3. Antimony.
  - 4. Benzene.
  - 5. Butyl benzyl phthalate.
  - 6. Cadmium.
  - 7. Di (2-ethylhexyl) phthalate.
  - 8. Di-n-butyl phthalate.
  - 9. Di-n-octyl phthalate.
  - 10. 1,2-dichlorobenzene.
  - 11. Diethyl phthalate.
  - 12. Dimethyl phthalate.
  - 13. Ethylbenzene.
  - 14. Ethylene Glycol.
  - 15. Formaldehyde.
  - 16. Hexavalent chromium.
  - 17. Isophorone.
  - 18. Lead.
  - 19. Mercury.
  - 20. Methyl ethyl ketone.
  - 21. Methyl isobutyl ketone.
  - 22. Methylene chloride.
  - 23. Naphthalene.
  - 24. Toluene (methylbenzene).
  - 25. 1,1,1-trichloroethane.
  - 26. Vinyl chloride.

## **2.04 MIXES:**

- A. Mix, prepare, and store painting and finishing materials in accordance with manufacturer's directions.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION:**

- A. Examine surfaces to be painted before beginning painting work. Work of other trades that has been left or installed in a condition not suitable to receive paint, stain other specified finish shall be repaired or corrected by the applicable trade before painting. Painting of defective or unsuitable surface implies acceptance of the surfaces.
- B. Beware of a condition known as critical lighting. This condition causes shadows that accentuate even the slightest surface variations. A pigmented sealer will provide tooth for succeeding decorative coating, but "does not" equalize smoothness or surface texture. Any corrective action to drywall must be done by the drywall contractor prior to decorating.

### **3.02 PROTECTION:**

- A. Protect previously installed work and materials, which may be affected by Work of this Section.
  - 1. Protect prefinished surfaces, lawns, shrubbery and adjacent surfaces against paint and damage.
  - 2. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or splatter from fouling surfaces not being painted.
  - 3. Protect surfaces, equipment, and fixtures from damage resulting from use of fixed, movable and hanging scaffolding, planking, and staging.
- B. Provide wet paint signs, barricades, and other devices required to protect newly finished surfaces. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

### **3.03 PREPARATION:**

- A. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.
- B. Concrete and Masonry: Surfaces shall be dry, clean, and free of dirt, efflorescence, encrustation, and other foreign matter. Glazed surfaces on concrete shall be roughened or etched to uniform texture.
- C. Ferrous Metal: Clean oil, grease, and foreign matter with solvent. Surface shall be primed within 3 hours after preparation.
- D. Sand and scrape metal to remove loose primer and rust.
- E. Non-Ferrous Metal: Chemically or solvent clean and then treat with an etching-type solution if recommended by the finish manufacturer. Cleaned and retreated Non-Ferrous Metal shall be primed the same day that cleaning has been performed.
- F. Wood Surfaces: Remove dust, grit and foreign matter. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks and other defects after priming and spot prime repairs when fully cured.
- G. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not-to-be-finish painted, or provide surface-applied protection. Reinstall removed items upon completion of work in each area.
- H. Existing surfaces to be recoated shall be thoroughly cleaned and de-glossed by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

- I. Thoroughly back-paint all surfaces of exterior and interior finish lumber and millwork, including doors and window frames, trim, cabinetwork, etc., which will be concealed after installation. Back-paint items to be painted or enameled with the priming coat. Use a clear sealer for back-priming where transparent finish is required.

### **3.03 PREPARATION:**

- J. Bare and covered pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.
- K. Preparation of other surfaces shall be performed following specific recommendations of the coatings manufacturer.
- L. Bond breakers and curing agents shall be removed and the surface cleaned before primers, sealers or finish paints can be applied.
- M. All drywall surfaces shall be completely dry and dust free before painting. Skim coated drywall shall be sealed with a sealer recommended by the paint manufacturer for this surface. Use the appropriate light or medium tack masking tape.

### **3.04 APPLICATION:**

- A. Apply painting and finishing materials in accordance with the manufacturer's recommendations.
  - 1. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
- B. Apply each material at not less than the manufacturer's recommended spreading rate:
- C. Apply prime coat to surface which is required to be painted or finished.
- D. Finish exterior doors on tops, bottoms, and edges same as exterior faces, after fitting.
- E. Sand lightly and dust clean between succeeding coats.

### **3.05 CLEANING, TOUCH-UP AND REFINISHING:**

- A. Carefully remove all spattering, spots and blemishes caused by work under this section from surfaces throughout the project.
- B. Upon completion of painting work remove all rubbish, paint cans, and accumulated materials resulting from work in each space or room. All areas shall be left in a clean, orderly condition.
- C. Runs, sags, misses, holidays, stains and other defects in the painted surfaces, including inadequate coverage and mil thickness shall be satisfactorily touched up, or refinished, or repainted as necessary.

### **3.06 FINISH SCHEDULE**

- A. Apply the following finishes to the surfaces specified on the finish schedule or on the drawings. Apply all materials in accordance with manufacturer's instructions on properly prepared surfaces and foundation coats. All intermediate undercoats must be tinted to approximate the final color.
  - 1. Architect will issue a color schedule prior to start of painting to designate the various

colors and locations required for the work.

**B. Exterior Systems:**

**1. Masonry Concrete Tilt-up**

**a. Flat - 100% Acrylic**

First Coat	EFF-STOP Select Masonry Primer/Sealer (ESSL00)
Second Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)
Third Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)

**b. Velvet - 100% Acrylic**

First Coat	EFF-STOP Select Masonry Primer/Sealer (ESSL00)
Second Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)
Third Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)

**c. Eggshell - 100% Acrylic**

First Coat	EFF-STOP Select Masonry Primer/Sealer (ESSL00)
Second Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)
Third Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

**e. Low Sheen - 100% Acrylic**

First Coat	Eff-Stop Select Masonry Primer/Sealer (ESSL00)
Second Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)
Third Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

**f. Semi-Gloss or Gloss - 100 % Acrylic**

First Coat	Eff-Stop Select Masonry Primer/Sealer (ESSL00)
Second Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)
Third Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)

**2. Masonry and Stucco**

**a. Flat – Modified Copolymer / 100% Acrylic**

First Coat	FLEX-PRIME Select, Flexible Crack-Resistant Primer (FPSL00)
Second Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)
Third Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)

**b. Velvet Sheen - Modified Copolymer / 100% Acrylic**

First Coat	FLEX-PRIME Select, Flexible Crack-Resistant Primer (FPSL00)
Second Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)
Third Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)

**c. Eggshell - Modified Copolymer / 100% Acrylic**

First Coat	FLEX-PRIME Select, Flexible Crack-Resistant Primer (FPSL00)
Second Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)
Third Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

**d. Low Sheen – Modified Copolymer / 100% Acrylic**

First Coat	FLEX-PRIME Select, Flexible Crack-Resistant Primer (FPSL00)
Second Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)
Third Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

**e. Semi-Gloss or Gloss – Modified Copolymer / 100% Acrylic**

First Coat	FLEX-PRIME Select, Flexible Crack-Resistant Primer (FPSL00)
Second Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)
Third Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)

**f. Elastomeric - Modified Acrylic**

First Coat	ELAST-O-KOTE Surface Conditioner
Second Coat	ELAST-O-KOTE 5, High Build Elastomeric Waterproofing
Third Coat	ELAST-O-KOTE 5, High Build Elastomeric Waterproofing

**g. Graffiti Barrier - Unpainted Surface - Waterborne Urethane/Waterborne Polyurethane**

First Coat	DUMOND CHEMICAL, WATCH DOG CPU, Masonry Primer/Sealer
Second Coat	DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

**h. Graffiti Barrier - Painted Surface - Waterborne Polyurethane**

One Coat DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

**3. Exterior Gypsum Board**

**a. Flat – 100% Acrylic**

First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)
Third Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)

**b. Velvet Sheen – 100% Acrylic**

First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)
Third Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)

**c. Eggshell – 100% Acrylic**

First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)
Third Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

**d. Low Sheen – 100% Acrylic**

First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)
Third Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

e. Semi-Gloss or Gloss – 100% Acrylic

First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)
Third Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)

4. Concrete Block – CMU

a. Flat –Acrylic Copolymer / 100% Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)
Third Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)

b. Velvet - Acrylic Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)
Third Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)

c. Eggshell - Acrylic Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)
Third Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

d. Low Sheen – Acrylic Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)
Third Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

e. Semi-Gloss or Gloss – Acrylic Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)
Third Coat	SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)

f. Graffiti Barrier - Unpainted Surface - Waterborne Urethane/Waterborne Polyurethane

First Coat	DUMOND CHEMICAL, WATCH DOG CPU, Masonry Primer/Sealer
Second Coat	DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane 09 90 00-9

g. Graffiti Barrier - Painted Surface - Waterborne Polyurethane

One Coat DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

5. Wood – Paint Finish

a. Flat – 100% Acrylic



First Coat EZ-PRIME Premium, Exterior Wood Primer (EZPR00)  
Second Coat SPARTASHIELD Exterior Flat Paint (SSHL10)  
Third Coat SPARTASHIELD Exterior Flat Paint (SSHL10)

b. Velvet - 100% Acrylic

First Coat EZ-PRIME Premium, Exterior Wood Primer (EZPR00)  
Second Coat SPARTASHIELD Exterior Velvet Paint (SSHL20)  
Third Coat SPARTASHIELD Exterior Velvet Paint (SSHL20)

c. Eggshell - 100% Acrylic

First Coat EZ-PRIME Premium, Exterior Wood Primer (EZPR00)  
Second Coat SPARTASHIELD, Exterior Eggshell Paint (SSHL30)  
Third Coat SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

d. Low Sheen – 100% Acrylic

First Coat EZ-PRIME Premium, Exterior Wood Primer (EZPR00)  
Second Coat SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)  
Third Coat SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

e. Semi-Gloss or Gloss – 100% Acrylic

First Coat EZ-PRIME Premium, Exterior Wood Primer (EZPR00)  
Second Coat SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)  
Third Coat SPARTASHIELD, Exterior Semi-Gloss or Gloss Paint (SSHL50) or (SSHL60)

f. Graffiti Barrier - Painted Surface - Waterborne Urethane/Waterborne Polyurethane

One Coat DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

6. Wood Rough Sawn – Stain Finish – Opaque:

Two Coats SPARTASHIELD Exterior Flat Paint (SSHL10)

7. Wood – Stain Finish – Semi-Transparent:

Two Coats OKON WEATHER PRO, 100% Acrylic Semi-Transparent Stain (WPT3)

8. Ferrous Metal

a. Flat – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1 series)  
Second Coat SPARTASHIELD Exterior Flat Paint (SSHL10)  
Third Coat SPARTASHIELD Exterior Flat Paint (SSHL10)

b. Velvet – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1 series)

Second Coat SPARTASHIELD Exterior Velvet Paint (SSHL20)  
Third Coat SPARTASHIELD Exterior Velvet Paint (SSHL20)

c. Eggshell – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer  
(BRPR00-1 series)  
Second Coat SPARTASHIELD, Exterior Eggshell Paint (SSHL30)  
Third Coat SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

d. Low Sheen - Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer  
(BRPR00-1 series)  
Second Coat SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)  
Third Coat SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

e. Semi-Gloss – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer  
(BRPR00-1 series)  
Second Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint  
(W-9)  
Third Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint  
(W-9)

B. Exterior Systems: (Continued)

8. Ferrous Metal (Continued)

f. Semi-Gloss – Modified Aluminum Epoxy Mastic / Aliphatic Acrylic Polyurethane

First Coat CARBOLINE, CARBOMASTIC, Epoxy 15  
Second Coat CARBOLINE, CARBOTHANE, Acrylic Polyurethane 133 Series  
Third Coat CARBOLINE, CARBOTHANE, Acrylic Polyurethane 133 Series

g. Gloss – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer  
(BRPR00-1 series)  
Second Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint  
(W-10)  
Third Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint  
(W-10)

h. Gloss - Modified Aluminum Epoxy Mastic / Aliphatic Acrylic Polyurethane

First Coat CARBOLINE, CARBOMASTIC, Epoxy 15  
Second Coat CARBOLINE, CARBOTHANE, Acrylic Polyurethane 134 Series  
Third Coat CARBOLINE, CARBOTHANE, Acrylic Polyurethane 134 Series

i. Graffiti Barrier - Painted Surface - Waterborne Urethane/Waterborne Polyurethane

One Coat DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

**9. Non-Ferrous Metal**

**a. Flat – Alkyd / 100% Acrylic**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)
Third Coat	SPARTASHIELD Exterior Flat Paint (SSHL10)

**b. Velvet Sheen - Alkyd / 100% Acrylic**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)
Third Coat	SPARTASHIELD Exterior Velvet Paint (SSHL20)

**c. Eggshell - Alkyd / 100% Acrylic**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)
Third Coat	SPARTASHIELD, Exterior Eggshell Paint (SSHL30)

**d. Low Sheen - Alkyd / 100% Acrylic ( Existing Exterior/Site Metals)**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)
Third Coat	SPARTASHIELD, Exterior Low Sheen Paint (SSHL40)

**e. Semi-Gloss – Alkyd / 100% Acrylic (Exterior Metal Doors, factory primed)**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)
Third Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)

**f. Semi-Gloss – Modified Aluminum Epoxy Mastic / Aliphatic Polyurethane**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	CARBOLINE, CORBOMASTIC EPOXY 15
Second Coat	CARBOLINE, CARBOTHANE, Acrylic Polyurethane 133 Series
Third Coat	CARBOLINE, CARBOTHANE, Acrylic Polyurethane 133 Series

**g. Gloss – Alkyd / 100%Acrylic**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	GALV-ALUM Premium, Non Ferrous Metal Primer (GAPR00)
Second Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint (W10)
Third Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint (W10)

**h. Gloss - Modified Aluminum Epoxy Mastic Aliphatic Polyurethane**

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	CARBOLINE, CARBOLINE, CORBOMASTIC EPOXY 15
Second Coat	CARBOLINE, CARBOTHANE, Acrylic Polyurethane 134 Series
Third Coat	CARBOLINE, CARBOTHANE, Acrylic Polyurethane 134 Series

i. Graffiti Barrier - Painted Surface - Waterborne Urethane/Waterborne Polyurethane

One Coat DUMOND CHEMICAL, WATCH DOG CPU-747, Polyurethane

C. Interior Systems:

1. Gypsum Board

a. Flat - Acrylic Copolymer

First Coat	VINYLASTIC Select, Interior Wall Sealer (VNSL00)
Second Coat	SPARTAWALL, Interior Flat Paint (SWLL10)
Third Coat	SPARTAWALL, Interior Flat Paint (SWLL10)

b. Velvet Sheen – Acrylic Copolymer

First Coat	VINYLASTIC Select, Interior Wall Sealer (VNSL00)
Second Coat	SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)
Third Coat	SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

c. Eggshell – Acrylic Copolymer / Acrylic

First Coat	VINYLASTIC Select, Interior Wall Sealer (VNSL00)
Second Coat	SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)
Third Coat	SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

d Low Sheen - Acrylic Copolymer / Acrylic

First Coat	VINYLASTIC Select, Interior Wall Sealer (VNSL00)
Second Coat	SPARTAWALL, Interior Low Sheen Paint (SWLL40)
Third Coat	SPARTAWALL, Interior Low Sheen Paint (SWLL40)

e. **Semi-Gloss or Gloss – Acrylic Copolymer / Acrylic or 100% Acrylic**  
(Toilet Rooms)

First Coat	VINYLASTIC Select, Interior Wall Sealer (VNSL00)
Second Coat	SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)
Third Coat	SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)

f. Gloss - Waterborne Acrylic / Cycloaliphatic Amine Epoxy

First Coat	CARBOLINE, CARBOCRYLIC, Waterborne Acrylic Bonding Primer 120
Second Coat	CARBOLINE, CARBOGUARD, Epoxy 890
Third Coat	CARBOLINE, CARBOGUARD, Epoxy 890

g. Flat - Zero VOC / Modified Copolymer

First Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Primer (W600)
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Second Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat Paint (W601)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat Paint (W601)

h. Low Sheen - Zero VOC / Modified Copolymer

First Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Primer (W600)  
Second Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 602)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 602)

i. Semi-Gloss - Zero VOC / Modified Copolymer / 100% Acrylic

First Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Primer (W600)  
Second Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Semi-Gloss (W 603)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Semi-Gloss (W 603)

j. Gloss - Zero VOC / Acrylic / Epoxy

First Coat RUSTOLEUM, SIERRA GRIPTEC, Multi-Surface Primer S30  
Second Coat RUSTOLEUM, SIERRA, Industrial Epoxy Enamel S60  
Third Coat RUSTOLEUM, SIERRA, Industrial Epoxy Enamel S60

2. Masonry Concrete Tilt-up / Plaster

a. Flat - 100% Acrylic / Acrylic Copolymer

First Coat EFF-STOP Select Masonry Primer/Sealer (ESSL00)  
Second Coat SPARTAWALL, Interior Flat Paint (SWLL10)  
Third Coat SPARTAWALL, Interior Flat Paint (SWLL10)

b. Velvet Sheen - 100% Acrylic / Acrylic

First Coat EFF-STOP Select Masonry Primer/Sealer (ESSL00)  
Second Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)  
Third Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

c. Eggshell - 100% Acrylic / Acrylic

First Coat EFF-STOP Select Masonry Primer/Sealer (ESSL00)  
Second Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)  
Third Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

d. Low Sheen - 100% Acrylic / Acrylic

First Coat EFF-STOP Select Masonry Primer/Sealer (ESSL00)  
Second Coat SPARTAWALL, Interior Low Sheen Paint (SWLL40)  
Third Coat SPARTAWALL, Interior Low Sheen Paint (SWLL40)

e. Semi-Gloss or Gloss - 100% Acrylic / Acrylic or 100% Acrylic

First Coat EFF-STOP Select Masonry Primer/Sealer (ESSL00)  
Second Coat SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)  
Third Coat SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)

f. Gloss - Waterborne Acrylic / Cycloaliphatic Epoxy

First Coat CARBOLINE, CARBOCRYLIC, Waterborne Acrylic Bonding Primer  
120  
Second Coat CARBOLINE, CARBOGUARD, Epoxy 890  
Third Coat CARBOLINE, CARBOGUARD, Epoxy 890

g. Flat - Zero VOC / Modified Copolymer

First Coat ECOSHIELD, Low-Order/Zero VOC Int. Latex Primer (W600)  
Second Coat ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W 601)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W 601)

h. Low Sheen - Zero VOC / Modified Copolymer

First Coat ECOSHIELD, Low-Order/Zero VOC Int. Latex Primer (W 600)  
Second Coat ECOSHIELD, Low-Order/Zero VOC Int. Latex Low Sheen Paint (W  
602)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W  
602)

i. Semi-Gloss - Zero VOC / Modified Copolymer / 100% Acrylic

First Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Primer (W600)  
Second Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Semi-Gloss (W 603)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Semi-Gloss (W 603)

j. Gloss - Zero VOC / Acrylic / Epoxy

First Coat RUSTOLEUM, SIERRA GRIPTEC, Multi-Surface Primer S-30  
Second Coat RUSTOLEUM, SIERRA, Industrial Epoxy Gloss Enamel S60  
Third Coat RUSTOLEUM, SIERRA, Industrial Epoxy Gloss Enamel S60

3. Concrete Block – CMU

a. Flat – Modified Copolymer / Acrylic Copolymer

First Coat SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER  
(SBSL00)  
Second Coat SPARTAWALL, Interior Flat Paint (SWLL10)  
Third Coat SPARTAWALL, Interior Flat Paint (SWLL10)

b. Velvet Sheen – Modified Copolymer / Acrylic Copolymer

First Coat SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)  
Second Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)  
Third Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

c. Eggshell – Modified Copolymer / Acrylic

First Coat SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER  
(SBSL00)  
Second Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)  
Third Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

d. Low Sheen – Modified Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTAWALL, Interior Low Sheen Paint (SWLL40)
Third Coat	SPARTAWALL, Interior Low Sheen Paint (SWLL40)

e. Semi-Gloss or Gloss – Modified Copolymer / Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)
Third Coat	SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or SSSL60)

f. Gloss - Waterborne Acrylic / Cycloaliphatic Amine Epoxy

First Coat	CARBOLINE, SANTILE Waterborne Acrylic Block Filler 100
Second Coat	CARBOLINE, CARBOGUARD, Epoxy 890
Third Coat	CARBOLINE, CARBOGUARD, Epoxy 890

g. Flat - Zero VOC - Finish Coat / Modified Copolymer

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W 601)
Third Coat	ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W 601)

h. Low Sheen - Zero VOC - Finish Coat / Modified Copolymer

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 602)
Third Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 602)

i. Semi-Gloss - Zero VOC - Finish Coat / Modified Copolymer / 100% Acrylic

First Coat	SMOOTH BLOCFIL SELECT CONCRETE BLOCK FILLER (SBSL00)
Second Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 603)
Third Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Low Sheen Paint (W 603)

4. Wood – Paint Finish

a. Flat – 100% Acrylic / Acrylic Copolymer

First Coat	INTER-KOTE, Interior Undercoater (W 6325)
Second Coat	SPARTAWALL, Interior Flat Paint (SWLL10)
Third Coat	SPARTAWALL, Interior Flat Paint (SWLL10)

b. Velvet Sheen – 100% Acrylic / Acrylic Copolymer

First Coat	INTER-KOTE, Interior Undercoater (W 6325)
Second Coat	SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

Third Coat      SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

**c. Eggshell – 100% Acrylic / Acrylic** (Interior Wood Doors, factory primed)

First Coat      INTER-KOTE, Interior Undercoater (W 6325)  
Second Coat      SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)  
Third Coat      SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

**d. Low Sheen – 100% Acrylic / Acrylic**

First Coat      INTER-KOTE, Interior Undercoater (W 6325)  
Second Coat      SPARTAWALL, Interior Low Sheen Paint (SWLL40)  
Third Coat      SPARTAWALL, Interior Low Sheen Paint (SWLL40)

**e. Semi-Gloss or Gloss – 100 %Acrylic / Acrylic**

First Coat      INTER-KOTE, Interior Undercoater (W 6325)  
Second Coat      SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or  
SSHL60)  
Third Coat      SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or  
SSHL60)

**f. Flat - Zero VOC / Modified Copolymer**

First Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Primer (W600)  
Second Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W601)  
Third Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Flat Paint (W 601)

**g. Low Sheen - Zero VOC / Modified Copolymer**

First Coat      ECOSHIELD, Low-Order/Zero VOC Int.Latex Primer (W 600)  
Second Coat      ECOSHIELD, Low-Order/Zero VOC Int.Latex Low Sheen Paint (W  
602)  
Third Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Low Sheen Paint (W  
602)

**h. Semi-Gloss - Zero VOC / Modified Copolymer / 100% Acrylic**

First Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Primer (W600)  
Second Coat      ECOSHIELD, Low-Order/Zero VOC Int. Latex Semi-Gloss  
(W 603)  
Third Coat      ECOSHIELD, Low-Order/Zero VOC Interior Latex Semi-Gloss  
(W 603)

**5. Wood – Stain & Clear Finishes**

**a. Satin – Alkyd / Alkyd Polyurethane**

Stain              STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      DEFTHANE, Polyurethane Clear Satin  
Second Coat      DEFTHANE, Polyurethane Clear Satin  
Third Coat      DEFTHANE, Polyurethane Clear Satin

**b. Semi-Gloss – Alkyd / Alkyd Polyurethane**

Stain              STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      DEFTHANE, Polyurethane Clear Semi-Gloss



Second Coat    DEFTHANE, Polyurethane Clear Semi-Gloss  
Third Coat     DEFTHANE, Polyurethane Clear Satin

c.    Gloss – Alkyd / Alkyd Polyurethane

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      DEFTHANE, Polyurethane Clear Gloss  
Second Coat    DEFTHANE, Polyurethane Clear Gloss  
Third Coat      DEFTHANE, Polyurethane Clear Satin

d.    Satin – Alkyd / Acrylic Polyurethane

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CABOT, Water-Borne Polyurethane (8082)  
Second Coat    CABOT, Water-Borne Polyurethane (8082)  
Third Coat      CABOT, Water-Borne Polyurethane (8082)

e.    Semi-Gloss – Alkyd / Acrylic Polyurethane

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CABOT, Water-Borne Polyurethane (8087)  
Second Coat    CABOT, Water-Borne Polyurethane (8087)  
Third Coat      CABOT, Water-Borne Polyurethane (8087)

f.    Gloss – Alkyd / Acrylic Polyurethane

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CABOT, Water-Borne Polyurethane (8080)  
Second Coat    CABOT, Water-Borne Polyurethane (8080)  
Third Coat      CABOT, Water-Borne Polyurethane (8080)

g. Eggshell – Alkyd / Lacquer

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CONTRACTOR'S EDGE, Production Sanding Sealer  
                    (CE-PROSS)  
Second Coat    CONTRACTOR'S EDGE, Production Clear Lacquer  
                    (CE-PRO 20)  
Third Coat      CONTRACTOR'S EDGE, Production Clear Lacquer  
                    (CE-PRO 20)

h.    Semi-Gloss – Alkyd / Lacquer

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CONTRACTOR'S EDGE, Production Sanding Sealer  
                    (CE-PROSS)  
Second Coat    CONTRACTOR'S EDGE, Production Clear Lacquer  
                    (CE-PRO60)  
Third Coat      CONTRACTOR'S EDGE, Production Clear Lacquer  
                    (CE-PRO60)

i. Gloss – Alkyd / Lacquer

Stain            STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat      CONTRACTOR'S EDGE, Sanding Sealer (CE- PROSS)  
Second Coat    CONTRACTOR'S EDGE, Production Clear Lacquer

Third Coat (CE-PRO90)  
CONTRACTOR'S EDGE, Production Clear Lacquer  
(CE-PRO90)

j. Low Sheen – Alkyd / Water White Lacquer

Stain STAINSEAL (V-QYB or V-QYR Series) Interior Wiping Oil Stain  
First Coat CONTRACTOR'S EDGE, Water White Sanding Sealer  
(CE-WWSS)  
Second Coat CONTRACTOR'S EDGE, Water White Clear Lacquer  
(CE-WW10)  
Third Coat CONTRACTOR'S EDGE, Water White Clear Lacquer  
(CE-WW10)

## 6. Ferrous Metal

### a. Flat – Alkyd Emulsion / Acrylic Copolymer

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)  
Second Coat SPARTAWALL, Interior Flat Paint (SWLL10)  
Third Coat SPARTAWALL, Interior Flat Paint (SWLL10)

### b. Velvet Sheen – Alkyd Emulsion / Acrylic Copolymer

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)  
Second Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)  
Third Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

### c. Eggshell Sheen - Alkyd Emulsion / Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)  
Second Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)  
Third Coat SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

### d. Low Sheen – Alkyd Emulsion / Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)  
Second Coat SPARTAWALL, Interior Low Sheen Paint (SWLL40)  
Third Coat SPARTAWALL, Interior Low Sheen Paint (SWLL40)

### e. Semi-Gloss or Gloss – Alkyd Emulsion / Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)  
Second Coat SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or  
SSHL60)  
Third Coat SPARTAWALL, Interior Semi-Gloss or Gloss Paint (SWLL50 or  
SSHL60)

### f. Semi-Gloss – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1  
series)

Second Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)  
Third Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)

f. Gloss – Alkyd Emulsion / 100% Acrylic

First Coat BLOC-RUST Premium, Rust Preventative Metal Primer (BRPR00-1 series)  
Second Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint (W-10)  
Third Coat SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-10)

h. Flat – Zero VOC / Acrylic Urethane / Modified Copolymer

First Coat RUSTOLEUM, METALMAX, DTM Acrylic Urethane Enamel S37  
Second Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat (W 601)  
Third Coat ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat (W 601)

i. Low Sheen – Zero VOC / Acrylic Urethane / Modified Copolymer

First Coat RUSTOLEUM, METALMAX, DTM Acrylic Urethane Enamel S37  
Second Coat ECOSHIELD, Low-Odor/Zero VOC Interior Latex Low Sheen Paint (W 602)  
Third Coat ECOSHIELD, Low-Odor/Zero VOC Interior Latex Low Sheen Paint (W 602)

j. Semi-Gloss – Zero VOC / Acrylic Urethane / 100% Acrylic

First Coat RUSTOLEUM, METALMAX, DTM Acrylic Urethane Enamel S37  
Second Coat ECOSHIELD, Low-Odor/Zero VOC Interior Latex Semi-Gloss Paint (W 603)  
Third Coat ECOSHIELD, Low-Odor/Zero VOC Interior Latex Semi-Gloss Paint (W 603)

**l. Low sheen Interior** (metal deck, exposed ducts, exposed beams and columns)

First Coat: Ultrashield DTM Gray primer  
Second Coat DE ULMS00  
Third Coat DE Ultrashield ULSH40

**6. Non Ferrous Metal**

a. Flat – 100% Acrylic / Acrylic Copolymer

Pretreatment SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)  
First Coat ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)  
Second Coat SPARTAWALL, Interior Flat Paint (SWLL10)  
Third Coat SPARTAWALL, Interior Flat Paint (SWLL10)

b. Velvet Sheen – 100% Acrylic / Acrylic

Pretreatment SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)  
First Coat ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)  
Second Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)  
Third Coat SPARTAWALL, Interior Velvet Sheen Paint (SWLL20)

c. Eggshell – 100% Acrylic / Acrylic

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)
Third Coat	SPARTAWALL, Interior Eggshell Sheen Paint (SWLL30)

d. Low Sheen – 100% Acrylic

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)
Third Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-9)

e. Semi-Gloss or Gloss – 100% Acrylic

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	ULTRA-GRIP Premium, Multi Purpose Primer (UGPR00-1)
Second Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Gloss Paint (W-10)
Third Coat	SYN-LUSTRO, Rust Preventive 100% Acrylic Semi-Gloss Paint (W-10)

f. Flat - Zero VOC / Acrylic Urethane / Modified Copolymer

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	RUSTOLUEM, METALMAX, DTM Acrylic Urethane Enamel S37
Second Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat (W 601)
Third Coat	ECOSHIELD, Low-Order/Zero VOC Interior Latex Flat (W 601)

g. Low Sheen - Zero VOC / Acrylic Urethane /Modified Copolymer

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	RUSTOLUEM, METALMAX, DTM Acrylic Urethane Enamel S37
Second Coat	ECOSHIELD, Low-Odor/Zero VOC Interior Latex Low Sheen Paint (W 602)
Third Coat	ECOSHIELD, Low-Odor/Zero VOC Interior Latex Low Sheen Paint (W 602)

h. Semi-Gloss - Zero VOC / Acrylic Urethane /100% Acrylic

Pretreatment	SUPREME CHEMICAL, METAL CLEAN AND ETCH (ME 01)
First Coat	RUSTOLUEM, METALMAX, DTM Acrylic Urethane Enamel S37
Second Coat	ECOSHIELD, Low-Odor/Zero VOC Interior Latex Semi-Gloss Paint (W 603)
Third Coat	ECOSHIELD, Low-Odor/Zero VOC Interior Latex Semi-Gloss Paint (W 603)

### 3.07 Specialty Painting and Coatings (Professional Line Products)

#### 1. EXTERIOR ACRYLIC LOW VOC METALLIC FINISH WITH HP CLEAR COAT – GLOSS AS SELECTED

Primer: 1<sup>st</sup> coat: Rustoleum Sierra S 70 Epoxy Primer  
Finish: 1<sup>st</sup> coat: Modern Masters Metallic Paint Collection – Color as Selected  
Finish: 2<sup>nd</sup> coat: Modern Masters Metallic Paint Collection – Color as Selected  
Finish: 3<sup>rd</sup> coat: Deft Industrial 36 Series Acrylic Polyurethane Clear Protective Topcoat

Note: Important to apply the Metallic over the S70 Primer within timeframes for adhesion – see data sheets / application guidelines

#### NOTICE

Availability of products listed in this specification may be affected by local, state, or federal regulatory requirements for architectural coatings. Consult your Dunn-Edwards representative for information on current product availability. Submittals prepared by Dunn-Edwards in accordance with this specification may include product codes that are modified with a letter suffix (e.g., W 901V or W 901E) to indicate the specific product formulation currently available to meet applicable requirements.

**END OF SECTION**

## SECTION 09 96 00

### HIGH-PERFORMANCE COATINGS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Work Included: Provide and install multi-part high-performance coatings, complete, as shown on Drawings and as specified, including:
  - 1. Locations: Area(s) as indicated by the Plan finish schedule.
  - 1. 2. Provide preparation and priming of substrate as recommended by the high-performance coatings manufacturer.
  - 2. 3. Provide and install multi-part high-performance coating as specified in this Section.
- B. Related Work Specified Elsewhere:
  - 1. Division 01 81 13 – Sustainable Design Requirements

##### 1.2 SUBMITTALS

- A. Comply with provisions of Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's technical data, installation instructions, and general recommendations for each high-performance coatings material required.
  - 1. Include certification that indicates compliance of materials with requirements.
- C. Samples: Submit, for verification purposes, 5-inch square samples of each type of high-performance coatings required, applied to a rigid backing, in color and finish indicated
  - 1. For initial selection of colors and finishes, submit manufacturer's color charts showing full range of colors and finishes available.
- D. Certificates: By manufacturer of high-performance coatings; upon completion of Work, written statement that technical support to applicator and field supervision was sufficient to assure proper application of materials and that installation is acceptable.
- E. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.

##### 1.3 QUALITY ASSURANCE

- A. Qualifications of the Applicator: Licensed or approved by the manufacturer of the coating system and has successfully completed 5 projects of similar size and complexity.
- B. Single Source Responsibility: Obtain primary high-performance coatings materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing and installing principal materials described in this Section.
- C. Special Requirements: Regulatory Agencies: Use materials for Work of this Section which comply with volatile organic compound limitations and other regulations of local Air Quality Management District and other local, state, and federal agencies having jurisdiction.

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- D. ISO 9001:2008: All materials, including primers, resins, curing agents, finish coats, aggregates and sealants are manufactured and tested under an ISO 9001:2008 registered quality system.

#### **1.4 PRE-INSTALLATION CONFERENCE**

- A. Comply with requirements of Section 01 31 19 – Project Meetings.
- B. Arrange a conference at the job site to coordinate high-performance coatings and critical finish systems, to be attended by the General Contractor, Architect/Owner's Representative and personnel involved in the actual manufacture as well as the installation of the Work in this Section and of the following Sections:
  - 1. Section 09 67 23 – Resinous Flooring

#### **1.5 PROJECT CONDITIONS**

- A. Utilities, including electric, water, heat (air temperature between 60 and 85°F/16 and 30°C and finished lighting to be supplied by General Contractor.
- B. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- C. Protection of finished wall from damage by subsequent trades shall be the responsibility of the General Contractor.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Material shall be delivered to job site and checked by high-performance coatings contractor for completeness and shipping damage prior to job start.
- B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors.
  - 1. ~~No on site weighing or volumetric measurements allowed.~~
- C. Material shall be stored in a dry, enclosed area protected from exposure to moisture.
  - 1. Temperature of storage area shall be maintained between 60 and 85-degrees F.

#### **1.7 WARRANTY**

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) one full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) one full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.
  - 1. High-performance coatings manufacturer representative shall return to project within 6 months to conduct inspection of installation area.

## **PART 2 - PRODUCTS**

### **2.1 HIGH-PERFORMANCE COATINGS**

#### **A. Colors:**

1. As selected by the Architect from manufacturer's standard colors.

#### **B. High-performance coatings**

1. Basis of Design: HT Primer and Stonkote GS4 at 8-10 mils DFT thickness as manufactured by Stonhard, [www.stonhard.com](http://www.stonhard.com) , Contact: Jeremy Mendelson (619) 886-4265 or [gmendelson@stonhard.com](mailto:gmendelson@stonhard.com).

#### **C. System Components: Manufacturer's standard components that are compatible with each other and are as follows:**

- 1) Epoxy Primer (HT Primer): A two-component epoxy primer applied at 4-5 mils DFT.
2. Finish Coat (Stonkote GS4):

##### **a. Resin: Epoxy**

Delete first subparagraph below if unnecessary.

- b. Formulation Description: Two-component, consisting of pigmented epoxy resin and curing agent.
- c. Type: Pigmented
- d. Application Method: Roller
- e. Application thickness: 4-5 mils
- f. Number of Coats: 1

## **3. PART 3 - EXECUTION**

Test above provides a more accurate indication as to whether or not a concrete slab has dried sufficiently to allow finish flooring application than the tests below.

For applying impermeable resinous flooring systems, 2 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) of slab in 24 hours is generally considered a safe moisture-vapor-emission rate. Consult manufacturers for appropriate rates for permeable systems that will allow moisture vapor to continue through them once cured.

### **3.1 EXAMINATION**

#### **A. General: Examine substrate to receive high-performance coating; give written notification of deficiencies. Do not proceed until unsatisfactory conditions are corrected.**

1. Substrate must be dry and free of all wax, grease, oils, fats, soil, loose or foreign materials and laitance.
  - a. Laitance and unbonded cement particles must be removed by mechanical means including the use of planetary grinders, metal shot blasting or similar methods.
  - b. Other contaminants may be removed by scrubbing with a heavy-duty industrial detergent, "Stonkleen DG9", or equal; and rinsing with clean water.
  - c. The surface must show open pores throughout and have a sandpaper texture.

### **3.2 PREPARATION**

#### **A. Surface Preparation: Concrete preparation shall be by mechanical means and include use of**

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a planetary grinder, diamond wheel grinders or metal-shot blast machine for removal of bond inhibiting materials such as curing compounds or laitance.

**B. Moisture Testing:** Test horizontal substrates to determine acceptable dryness.

1. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb per 1,000 sq. ft. per 24 hours.
2. Perform additional moisture tests recommended by manufacturer. Proceed with application of resinous flooring only after substrates pass testing and/or directed by manufacturer in writing.
3. Provide and install Osmotic Pressure Resistant membrane/grout only if moisture-vapor-emission rates exceed 3 lb per 1,000 sf. ft. per 24 hours.

### **3.3 MIXING**

**A. General:** Mix components only in amounts that can be applied within recommended application life.

1. Discard materials not used within application life.

### **3.4 SYSTEM APPLICATION**

**A. General:** Apply each component of high-performance coatings system in compliance with manufacturer's written directions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted except at divider strips, sawn joints or other types of joints (if any), indicated or required.

**B. High-performance coatings:**

1. **Primer:** Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates.
2. **Finish Coat:** Mix material according to manufacturer's recommended procedures. Please note that solvent reduction of any kind is strictly prohibited. Apply material immediately after mixing using high quality rollers or an airless sprayer. Strict adherence to manufacturer's coverage rates is imperative.

### **3.5 FIELD QUALITY CONTROL**

**A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of high-performance coating application.**

1. The Owner will engage service of an independent testing laboratory to sample materials being used on the job site. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
2. Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.
3. If test results show materials being used do not comply with specified requirements, Contractor may be directed by the Owner to stop work; remove non-complying materials; pay for testing; reapply coating materials to properly prepared surfaces which had previously been coated with unacceptable materials.

### **3.6 PROTECTION OF ADJACENT WORK**

4. A. General: High-performance coating system will be installed in locations where other adjacent finish materials may already be in place. Protect all adjacent surfaces during installation and finishing.
  1. Installed adjacent finishes shall be completely isolated from coating system installation. Provide Plastic ("Visqueen") wrap and mask all edges.
  2. Provide constant supervision and immediate clean up throughout high-performance coating system installation.

### **3.7 CURING, PROTECTION AND CLEANING**

- A. Cure high-performance coatings materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.
  5. Close area of application for a minimum of 24 hours.
- B. Protect high-performance coatings materials from damage and wear during construction operation.
  1. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application.
  2. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning:
  1. Remove temporary covering and clean high-performance coatings just prior to final inspection.
  2. Use cleaning materials and procedures recommended by high-performance coatings manufacturer.

**END OF SECTION**

## **SECTION 10 28 13**

### **TOILET ROOM ACCESSORIES**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. Provide toilet room accessories where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### **1.02 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

##### **1.03 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 66 00.

#### **PART 2 - PRODUCTS**

##### **2.01 MANUFACTURER**

- A. Provide the following products of Bobrick Washroom Equipment Company, or equal product(s) by Bradley Corporation: [www.bradleycorp.com](http://www.bradleycorp.com) approved in advance by the Architect
- B. Georgia Pacific (Towel Dispenser)

##### **2.02 MATERIALS**

- A. Paper towel dispenser:
  - 1. Series, manufactured by Georgia Pacific
  - 2. Refer to plan and interior elevation for location and model number.
- B. Mirrors:
  - 1. Series, manufactured by Bobrick.
  - 2. Refer to plan and interior elevation for size, location and model number.
- C. Toilet tissue:
  - 1. Series, manufactured by Bobrick.
  - 2. Refer to plan and interior elevation for location and model number.

**D. Soap Dish:**

1. Series, manufactured by Bobrick.
2. Refer to plan and interior elevation for location and model number.

**I. Hooks:**

1. Product: B-7672, manufactured by Bobrick.
2. Location: Refer to interior elevations

**J. Towel Shelf:**

1. Refer to plan and interior elevation for location and model number.

**K. Towel Bar:**

1. Refer to plan and interior elevation for location and model number.

**2.04 OTHER MATERIALS**

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 - EXECUTION**

**3.01 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

**3.02 INSTALLATION**

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install each item in its proper location, firmly anchored into position, level and plumb, and in accordance with the manufacturer's recommendations.

**END OF SECTION**

## **SECTION 32 13 13**

### **CONCRETE PAVING**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. This Section includes exterior Portland cement concrete paving for the following:
  - 1. Curbs and gutters
  - 2. Walkways
  - 3. Driveways
  - 3. Concrete pavement
  - 4. Concrete wheel stops
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Section 02300: Earthwork for subgrade preparation, grading and base course.
  - 2. Section 03300: Cast-In-Place Concrete for general building applications of concrete.

##### **1.3 SYSTEM DESCRIPTION**

- A. Provide concrete pavement according to the materials, workmanship, and other applicable requirements of the following standard specifications:
  - 1. Reference Specification: Perform all work in accordance with applicable provisions of "Standard Specifications for Public Works Construction", 2009; and City of Beverly Hills Standard drawings. Unless otherwise noted, mention herein of section numbers refers to sections of the Reference Specification. Where Reference Specification refers to "Agency", substitute the word "Owner". Where Reference Specification refers to "Engineer", substitute the word "Architect". Where Reference Specification is in conflict with these Specifications, these Specifications shall govern.
  - 2. Measurement and payment provisions and safety program submittals included in Reference Specifications do not apply to this Section.

##### **1.4 SUBMITTALS**

- A. General: Submit the following according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Design mixes for each class of concrete. Include revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Description of Methods and Sequence of Placement. For each type of specially-finished concrete provide description of methods and sequence of placement.
- D. Submit manufacturer's product data for the following:
  - 1. Form release agent.
  - 2. Concrete coloring additive.
  - 3. Prefabricated control joint.
  - 4. Preformed joint filler.
  - 5. Sealants.
  - 6. Slip plane joint.
  - 7. Concrete mix design.

- E. Submit two (2) 12" x 12" mockup samples of colored concrete in colors selected by the Architect.

## **1.5 QUALITY ASSURANCE**

- A. Concrete Standards: Comply with provisions of the following standards, except where more stringent requirements are indicated.
  - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
  - 2. ACI 318, "Building Code Requirements for Reinforced Concrete."
  - 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
  - 4. Standard Specifications for PWC (Green Book) latest edition, section 201-1.
- B. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Paving work, base course etc., shall be done only after excavation and construction work, which may damage them, have been completed. Damage caused during construction shall be repaired before acceptance.
- D. Existing paving area shall, if damaged or removed during the course of this project, be repaired or replaced under this section of the specification. Workmanship and materials for such repair and replacement, except as otherwise noted, shall match as closely as possible those employed in existing work.
- E. Pavement, base, or subbase shall not be placed on a muddy subgrade.
- F. Provide control joints as required to construct 100 sq. ft. maximum panel sizes. Provide sawcut joints. Note on shop drawings.
- G. Concrete Testing Service: Engage a qualified independent testing agency to perform materials evaluation tests and to design concrete mixes.

## **1.6 PROJECT CONDITIONS**

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

## **1.7 TESTING AND INSPECTION**

- A. The owner reserves the right to inspect and test paving and associated work.

## **PART 2 - PRODUCTS**

### **2.1 FORMS**

- A. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
  - 1. Use flexible or curved forms for curves of a 100-foot or less radius.
- B. Form Release Agent: Provide commercial formulation form-release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Debond Form Coating, L & M Construction Chemicals.
    - b. Crete-Lease 880 VOC, Cresset Chemical Company.

## **2.2 REINFORCING MATERIALS**

- A. Reinforcing Bars and Tie Bars: ASTM A 615, Grade 40 for #3 bars and Grade 60 for bars larger than #3, deformed.
- B. Plain, Cold-Drawn Steel Wire: ASTM A 82.
- C. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.
- D. Dowel Sleeves: Speed Dowel, Aztec Concrete Accessories, Inc.
- E. Hook Bolts: ASTM A 307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- F. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications.
  - 1. Use supports with sand plates or horizontal runners where base material will not support chair legs.
- G. Welded wire fabric reinforcement shall conform to the applicable requirements of ASTM A185. Fabric reinforcement shall be furnished in flat sheets. Fabric reinforcement in rolls will not be permitted.

## **2.3 CONCRETE MATERIALS**

- A. Portland Cement: ASTM C 150, Type II
  - 1. Use one brand of cement throughout Project. Coordinate with Division 03 Section "Cast-In-Place Concrete."
- B. Normal-Weight Aggregates: ASTM C 33, Class 4M non-reactive, and as follows. Provide aggregates from a single source:
  - 1. Maximum Aggregate Size: 1-inch.
  - 2. Do not use fine or coarse aggregates that contain substances that cause spalling.
  - 3. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
- C. Water: Potable.
- D. Admixtures: Comply with requirements specified in Division 03 Section "Cast-In-Place Concrete."
  - 1. Do not use admixtures containing calcium chloride or chloride ions.

## **2.4 COLOR ADMIXTURE**

- A. Refer to Architectural plans for concrete color.
- B. Color admixture shall be suitable for flatwork concrete and shall meet or exceed the requirements set by Portland Cement Association (PCA) and ATSM C 494.
- B. Color admixture shall be of a type and quality which will not adversely affect workability, setting, or strength of concrete. Color pigments shall consist of chemically inert, non-fading, alkali-fast mineral oxides, finely ground and specially prepared for the use in both cement and mortar. Admixture shall not contain calcium chloride.

- C. Color admixture shall be Chromix admixture, manufactured by L.M. Scofield Company, Los Angeles, CA 90040.
- D. Mix design shall conform to manufacturer's recommendations, and directions of the Architect to achieve proposed color. Strictly monitor additive / cement ratio throughout job to ensure uniform color.

## 2.5 CURING MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
  - 1. Waterproof paper.
  - 2. Polyethylene film.
  - 3. White burlap-polyethylene sheet.
- C. Liquid Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B. Moisture loss not more than 0.55 kg./sq. meter in 72 hours when applied at a rate of 200 sq. ft./gal.
  - 1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. L & M Cure R, L & M Construction Chemicals, Inc.
    - b. 1100-Clear, W.R. Meadows, Inc.
  - 3. Do not use sodium silicate type curing agents.
- D. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Eucobar; Euclid Chemical Co.
    - b. E-Con; L&M Construction Chemicals, Inc.
    - c. Confilm; Master Builders, Inc.

## 2.6 RELATED MATERIALS

- A. Bonding Agent: Acrylic or styrene butadiene, complying with ASTM C 1059, Type 2.
- C. Epoxy Adhesive: ASTM C 881, two-component material suitable for dry or damp surfaces. Provide material type, grade, and class to suit requirements.
- D. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Bonding Agent:
    - b. SBR Latex; Euclid Chemical Co.
    - c. Daraweld C; W.R. Grace & Co.
    - d. Everbond; L&M Construction Chemicals, Inc.
    - e. Acryl-Set; Master Builders Inc.
  - 2. Epoxy Adhesive:
    - a. Burke Epoxy M.V., The Burke Co.
    - b. Concsive Standard Liquid; Master Builders, Inc.
    - c. Rezi-Weld 1000; W.R. Meadows, Inc.
- E. Concrete Sealer: Water-based, deep penetrating, non-staining, non-darkening silane micro emulsion.
  - 1. Positive chloride-ion screening, prevents water intrusion, minimizes rebar corrosion and potential concrete spalling, and protects against damaging effects of alkalis and other contaminants.
  - 2. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.



3. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
  - a. Pentane WB, L & M Construction Chemicals, Inc. This product is intended to establish the characteristics and level of quality intended for this Project.

D. Expansion and Isolation Joint Fillers: ASTM D 1751, cellulosic fiber.

## **2.7 CONCRETE MIX**

- A. Prepare design mixes for each type and strength of normal-weight concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use a qualified independent testing agency for preparing and reporting proposed mix designs.
  1. Do not use the Owner's field quality-control testing agency as the independent testing agency.
- B. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with the following properties:
  1. Compressive Strength (28-Day): 2500 psi for concrete for non-vehicular sidewalks; 3200 psi for concrete for traffic areas, curbs and gutters.
  2. The minimum cement content shall be 5-1/4 sacks per cubic yard.
  3. The maximum concrete slump shall be 3 inches, plus or minus 1/2 inch, for all walks; and 4 inches, plus or minus 1 inch for all other Portland cement concrete paving.
  4. Water/Cement Ratios:
    - a. 0.5 maximum for concrete for pavement and site flatwork.
    - b. 0.45 maximum for all other concrete.
- C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.
- D. Admixtures: Comply with requirements specified in Division 03 Section "Cast-In-Place Concrete".

## **2.8 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.
  1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## **2.9 GROUT**

- A. Grout shall be mixed in the proportions of one part Portland cement to two parts sand, by volume. Only sufficient water shall be used to enable grout to barely hold its shape when squeezed into a ball in the hand. Sand for grout shall be "Fine Aggregate", conforming to ASTM C 33.
- B. Non-shrink grout shall be pre-mixed non-shrinking, high strength grout. Compressive strength in 28 days shall be 5,000 psi minimum, but in no case less than the specified strength of the adjacent concrete. Manufacturer shall provide evidence that the material meets the requirements of the COE CRD-C 621 (558). Grout permanently exposed to view shall be non-oxidizing; metallic grout may be used in other locations.

1. Non-shrink grout shall be one of the following or approved equal:

<u>Manufacturer</u>	<u>Product</u>
Gifford-Hill Co.	Supreme
Master Builders Co.	Embeco
U.S. Grout Corporation	Five Star Grout

## **2.10 SANDBLASTING MATERIAL**

- A. Material for sandblasting shall be 16/20 mesh sand.

## **2.11 HERBICIDE TREATMENT**

- A. Commercial chemical for weed control, registered by Environmental Protection Agency. Provide granular, liquid, or wettable powder form.
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
    - a. Ciba-Geigy Corp.
    - b. Dow Chemical U.S.A.
    - c. E.I. Du Pont de Nemours & Co., Inc.
    - d. FMC Corp.
    - e. Thompson-Hayward Chemical Co.
    - f. U.S. Borax and Chemical Corp.

## **PART 3 - EXECUTION**

### **3.1 SURFACE PREPARATION**

- A. Areas to be paved shall be compacted and brought to subgrade elevation per soils report before work of this section is performed. Final fine grading, filling, and compaction of areas to receive paving, as required to form a firm, uniform, accurate, and unyielding subgrade at required elevations and to required lines, shall be done under this Section.
- B. Existing subgrade material which will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring subgrade to required line and grade and to replace unsuitable material removed shall be material conforming to this Section.
- C. Subgrade of areas to be paved shall be re-compacted per soils report.
- D. Excavation required in pavement subgrade shall be completed before fine grading and final compaction of subgrade are performed. Where excavation must be performed in completed subgrade, base, or pavement, subsequent backfill and compaction shall be performed per soils report.
- E. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to 2 in. deep in subgrade, shall be graded out, reshaped as required, and re-compacted before placing pavement.
- F. Materials shall not be stored or stockpiled on subgrade.
- G. Disposal of debris and other material excavated under this section, and material unsuitable for or in excess of requirements for completing work of this section shall be disposed of off-site.

- H. Prepared subgrade will be inspected by Soils Engineer. Subgrade shall be approved before installation of gravel base course. Disturbance to subgrade caused by inspection procedures shall be repaired under this section of the specification.
- I. Proof-roll subgrade or base surface prepared by others to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
- J. Herbicide Treatment: Apply chemical weed control agent in strict compliance with manufacturer's recommended dosages and application instructions. Apply to compacted, dry subgrade prior to installation of base course.

### **3.2 EDGE FORMS AND SCREED CONSTRUCTION**

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for paving to required lines, grades, and elevations. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork and screeds for grade and alignment to following tolerances:
  - 1. Top of Forms: Not more than 1/8 inch in 10 feet.
  - 2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

### **3.3 PLACING REINFORCEMENT**

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, or other bond-reducing materials. Where there is delay in placing concrete after reinforcement is in place, bars shall be re inspected and cleaned when necessary.
- C. Any bar showing cracks after bending shall be discarded.
- D. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.
- F. After forms have been coated with form release agent, but before concrete is placed, reinforcing steel anchors shall be securely wired in the exact position called for, and shall be maintained in that position until concrete is placed and compacted. Chair bars and supports shall be provided in a number and arrangement satisfactory to the Architect.

### **3.4 JOINTS**

- A. General: Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline, unless indicated otherwise.
  - 1. When joining existing paving, place transverse joints to align with previously placed joints, unless indicated otherwise.
  - 2. Make joints, including sawed joints, full depth required and from edge to edge of paving.
- B. Contraction Joints: Provide weakened-plane contraction joints, sectioning concrete into areas as shown on Drawings. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness, as follows:

1. **Tooled Joints:** Form contraction joints in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool.
  2. **Sawed Joints:** Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into hardened concrete when cutting action will not tear, abrade, or otherwise damage surface and before development of random contraction cracks.
  3. **Inserts:** Form contraction joints by inserting pre-molded plastic, hardboard, or fiberboard strips into fresh concrete until top surface of strip is flush with paving surface. Radius each joint edge with a jointer tool. Carefully remove strips or caps of two-piece assemblies after concrete has hardened. Clean groove of loose debris.
- C. **Construction Joints:** Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.
1. Continue reinforcement across construction joints unless indicated otherwise. Do not continue reinforcement through sides of strip paving unless indicated.
  2. Provide tie bars at sides of paving strips where indicated.
  3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- D. **Isolation Joints:** Form isolation joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
1. Locate expansion joints at intervals of 50 feet, unless indicated otherwise.
  2. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealant is indicated. Place top of joint filler flush with finished concrete surface when no joint sealant is required.
  3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.
  4. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- E. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one half of dowel length to prevent concrete bonding to one side of joint.
- F. Where spacing is not shown, locate expansion joints at 10-foot maximum spacing.
- G. Where plastic "zip strips" are used to construct concrete joints, cut and remove, as a minimum, the top 1/4 inch of these strips after concrete has cured, and coordinate installation of joint filler, if shown on the Drawings.

### **3.5 CONCRETE PLACEMENT**

- A. **Inspection:** Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. **Moisten** subgrade or base to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- C. Comply with requirements and with ACI 304R for measuring, mixing, transporting, and placing concrete.
- D. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- E. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

- F. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete complying with ACI 309R.
  - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcing, dowels, and joint devices.
- G. Screed paved surfaces with a straightedge and strike off. Use bull floats or darbies to form a smooth surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces prior to beginning finishing operations.
- H. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete.
- I. Cold-Weather Placement: Comply with provisions of ACI 306R and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- J. Hot-Weather Placement: Place concrete complying with ACI 305R and as specified when hot weather conditions exist.
  - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
  - 3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

### 3.6 CONCRETE FINISHING

- A. Apply Top-Surface retarder- Sand Blast Finish to the all concrete pavements as indicated on the Drawings.
  - 1. For pedestrian traffic areas, finish shall be a non-slip surface with a minimum static coefficient of friction of 0.6.
    - a. For ramps, the static coefficient of friction shall be a minimum of 0.8. Ramps are defined as any sloping path of travel with a slope in the direction of travel of 5.0%, or greater.
  - 2. Tests for coefficient of friction shall be either ASTM C-1028 (field test) or ASTM D-2047 (laboratory test).
- B. Finishing formed surfaces:
  - 1. Curb forms shall leave a smooth face.
  - 2. Remove all fins.

- C. Provide steel trowel finish on tops of curbs and flow lines of curbs, gutters and integral curb and gutters.
- D. Final Tooling:
  - 1. Control joints at colored, top-cast concrete paving shall be saw cut.
  - 2. Tool edges gutters, curbs, and joints formed in fresh concrete with a jointing tool to the following radius. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
    - a. Radius: 1/4 inch.
    - b. Radius: 3/8 inch.
- F. Finish surfaces to produce a uniform appearance throughout area involved and throughout adjacent areas with the same treatment.
- G. Sandblast finish shall be consistent finish throughout and match approved mock-up.
- H. Where concrete finishing occurs adjacent to finished metal or other surfaces, particularly where serrated or indented surfaces occur, remove all traces of cement film before allowing to harden.

### **3.7 CONCRETE PROTECTION AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.
- B. Evaporation Control: In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before floating.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with a 12-inch lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
- E. Spray-apply concrete sealer to all concrete pavement. Comply with sealer manufacturer's application instructions.

### **3.8 CURING COLORED CONCRETE**

- A. Colored concrete shall not, under any circumstances, be cured using water fog misting or ponding, burlap, plastic sheeting, or other wet covering.

- B. Curing material and method shall be in strict conformance with manufacturer's guidelines and recommendations.
- C. Only if additional protection is absolutely required, the surface should remain uncovered for at least 4 days, after which time new and unwrinkled non-staining reinforced waterproof kraft curing paper may be used.

### 3.9 FIELD QUALITY CONTROL TESTING

- A. The Owner will employ a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include the following:
  - 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
    - a. Slump: ASTM C 143; one test at point of placement for each compressive-strength test but no less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
    - b. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test but no less than one test for each day's pour of each type of air-entrained concrete.
    - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
    - d. Compression Test Specimens: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless directed otherwise. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
    - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. Test one specimen at 7 days, test two specimens at 28 days, and retain one specimen in reserve for later testing if required.
  - 2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
  - 3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.
  - 4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
  - 5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. Test results will be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in paving, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.
- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- D. Additional Tests: The testing agency will make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

- E. <sup>4</sup> Manufacturer's Field Service: When placing integral colored concrete, arrange for the services of a qualified technical representative of the color pigment manufacturer, equipped with wet-batch color control test devices to ensure concrete of uniform color and matching approved mock-up.

### **3.10 REPAIRS AND PROTECTION**

- A. Remove and replace concrete paving that is broken, damaged, or defective, or does not meet the requirements of this Section. Concrete which is not true to line and plane, which is not thoroughly troweled and properly surfaced as required, which varies in excess of 1/4-inch along a 10-foot straight edge, which is scuffed or has a rough top surface, except where required, or which does not connect properly to adjoining work, does not slope as required for drainage or is not properly cured, will be deemed defective.
1. General: Patch defective areas immediately following form removal. Remove defective concrete to a width and depth necessary for proper patching, but in no case less than 1 inch deep. Make the walls of the cut area perpendicular to the surface and do not feather out the edge. Dampen the patch area and the adjacent area 6 inches around the patch area.
  2. Exposed concrete: Prepare a patching mortar of one part Portland cement, adjusted to match the color of the surrounding concrete, and 2-1/2 parts sand with the least water required to produce a workable mass. Re-work this mortar until it is the stiffest consistency that will permit placing. Brush the patch area with a bond of neat cement and water paste and apply patching mortar when the water sheen is off the bond. Strike off the mortar slightly higher than the surrounding surface, let set for 1 hour and finish flush with the surrounding surface.
- B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

**END OF SECTION**



## **SECTION 32 32 19**

### **CONCRETE UNIT MASONRY WALLS**

#### **PART 1 – GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Deviations from the plans and specifications shall not be made without the written approval of the architect and/or engineer.

##### **1.2 SUMMARY**

- A. This Section includes site concrete masonry unit (CMU) retaining walls, fences and enclosures.
- B. Related Sections:
  - 1. Division 2 Section "Earthwork" for excavation for site retaining walls.
  - 2. Division 4 Section "Concrete Block Masonry" for decorative concrete masonry units with faces required to match site retaining wall units.

##### **1.3 SCOPE OF WORK**

- A. Furnish and install concrete masonry units, mortar, grout, and masonry reinforcing steel. Provide equipment necessary for their installation.
- B. Install items furnished by others: bolts, anchor bolts, angles, hinges, and built-ins.
- C. Arrange for adequate bracing, forming, and shoring required in conjunction with and in the course of constructing the concrete masonry.
- D. Advise the general contractor as to the position of all dowels for the masonry. The general contractor shall be responsible for the placement of all dowels in any adjoining construction.
- E. Arrange for inspections.

##### **1.4 QUALITY ASSURANCE**

- A. Submittals
  - 1. Certificates of compliance with all applicable ASTM and UBC standards shall be submitted on all products specified herein.
  - 2. Sample Specimens: Provide one sample specimen of the proposed CMU. Include color, surface treatment, and mortar color.
- B. Sample Panel
  - 1. Construct an approximate 6 feet long by 4 feet high mock-up panel for representation of completed masonry, joint tooling, design details, and workmanship.
  - 2. Panel shall not be part of the wall system.
  - 3. Include typical base and cap or finished top construction.
- C. Inspections: Non continuous inspection allowed.
- D. Tests: Owner shall pay all costs for tests.

1. Concrete masonry units per ASTM C 140.
2. Mortar per UBC Standard 21-6.
3. Grout per ASTM C 1019.
4. Prisms per UBC Standard 21-17.

## **1.5 PRODUCT HANDLING AND STORAGE**

- A. Materials of this section shall be protected to maintain quality and physical requirements.
- B. All masonry units shall be stored on the jobsite so that they are protected from rain, stored off the ground and kept clean from contamination.
- C. Handle units carefully to avoid breakage and damage to finished faces.
- D. Glazed and ground faced masonry units shall be stored on pallets on level ground, single stacked only, and covered to protect against inclement weather. Keep protective block face covers on glazed units until installation.

## **1.6 EXTREME WEATHER CONDITIONS**

- A. Cold Weather Conditions (40°F or below):
  1. Wet or frozen units shall not be laid. Temperature of units when laid shall not be less than 20°F.
  2. Aggregates and mixing water shall be heated to produce mortar and grout temperatures between 40°F and 120°F.
  3. Maintain mortar temperature on boards above 32°F.

## **PART 2 – MATERIALS**

### **2.1 CONCRETE MASONRY UNITS**

- A. Load bearing concrete masonry units shall conform to UBC Standard 21-4, Grade N, and ASTM C 90. All units shall be Medium-weight, 1900 net PSI, as manufactured by:  
Orco Block and Hardscape (714) 932-7125
  - a. CMU Type: Precision, Color: To Match Existing

Note: Item(s) indicated above may require manufacturing lead time; contact a Representative for details. Material must be ordered well in advance of anticipated masonry start.

- B. Unless otherwise specified on the plans, blocks shall be hollow, load bearing concrete units, conforming to ASTM C-90, grade 'N'. No special inspection required for masonry construction.
- C. Block units shall be constructed in running bond. Architectural finish, type of block, color and top course treatment shall match those of existing walls.
- D. All Units shall be manufactured with integral water-repellent.
- E. Block cells shall be unobstructed and shall have vertical continuity. Cells shall be filled with grout. Maximum height of pour shall be 4 feet.

## 2.2 ARCHITECTURAL CONCRETE MASONRY UNITS

- A. Load bearing concrete masonry units shall conform to UBC Standard 21-4, Grade N, and ASTM C 90. All units shall be Medium-weight, 1900 net PSI, Custom Ultra Burnished Polished Masonry as manufactured by Headwaters Construction Materials (888)464-931

Local Distributor: Orco Block and Hardscape (714) 932-7125

1. Provide solid cap Blocks at top of yard walls as indicated on the Drawings.  
Pattern: Stack Bond and per drawings.  
Color: #700P White Limestone
2. Provide closed-end units at walls and at openings where ends will be exposed in  
finish Work shall be polished;
3. Provide bond beam blocks where horizontal reinforcement is indicated.
4. Provide special shapes and accessory units at locations indicated on Drawings.
5. Provide shell face where indicated on the drawing.
6. Blocks that are exposed shall all be polished finish on both sides and at exposed corners blocks.
7. All Units shall be manufactured with integral water-repellent.
8. Masonry unit shall have been cured for a minimum of 28 days.
9. Masonry unit shall have maximum liner shrinkage or 0.065 percent from saturated to oven dry.
10. Sealant: Apply manufacturer-specified sealer on all burnished units.  
Recommended.
11. coatings are as follows:
  - i. TK-192, waterborne acrylic
  - ii. TK Bright Kure and Seal, solvent-borne acrylic.
  - iii. VOC content limits shall be maximum 250 grams/liter.
12. Submit two (2) samples of raw burnished block and two (1) samples of sealed blocks for approval.
13. Provide a mockup of 32" high and 32" wide grouted showing flush joints.

Note: Item(s) indicated above may require manufacturing lead time; contact a Representative for details. Material must be ordered well in advance of anticipated masonry start.

- B. Unless otherwise specified on the plans, blocks shall be hollow, load bearing concrete units, conforming to ASTM C-90, grade 'N'. No special inspection required for masonry construction.
- C. Block units shall be constructed in running bond. Architectural finish, type of block, color and top course treatment shall match those of existing walls.
- D. Block cells shall be unobstructed and shall have vertical continuity. Cells shall be filled with grout. Maximum height of pour shall be 4 feet.

## 2.2 MORTAR

- A. Mortar shall be Spec Mix Pre-blended Masonry Mortar, Type S, conforming to the proportion and property specifications of ASTM C 270, as manufactured by E-Z Mix Inc., Sun Valley, CA. or approved equal.

**B. Mortar Materials:**

1. Admixtures: Use no admixtures, air-entraining agents, plasticizers, salts, or antifreeze compounds unless specified and approved in advance by the Structural Engineer and E-Z Mix, Inc. or approved equal manufacturer.
2. Water: Use clean, potable and free of deleterious amounts of acids, alkalies or organic materials.
3. Exterior tuckpointing grout for glazed masonry units shall use Laticrete 1776 Grout Admix Plus full strength in lieu of mixing water, or approved equal.

**2.3 GROUT**

- A. Pre-blended Grout: PRE-MIX Products, Spec Concrete 30/70, 2000 PSI. minimum. Grout Mix manufactured by E-Z Mix Inc. may be used per manufacturer's specifications.
- B. Grout shall conform to UBC Standard 21-19 or ASTM C 476, proportions per UBC Table 21-B.
- C. Use of fine or coarse grout shall be per UBC Table 21-C.
- D. Minimum compressive strength shall be 2000 PSI.
- E. Grout shall be of fluid consistency with an 8 inch to 10 inch slump.
- F. Admixtures: PRE-MIX Products Grout Additive. Use per manufacturer's specifications.

**2.4 REINFORCING STEEL**

- A. Joint Reinforcement shall conform to UBC Standard 21-10.
- B. Metal Ties and Anchors shall meet the requirements of UBC Section 2102.2.7.
- C. All metal reinforcement shall be free from loose rust and other harmful matter or coatings.
- D. Reinforcing steel shall be ASTM A-615, grade 40 for smaller than #5 bars, and grade 60 for #5 and large bars.
- E. Unless otherwise noted on the plans, bar splices shall be 48 bar diameter, and shall be staggered where possible.
- F. Where heights of wall make impractical to have a continuous bar extending upward from the footing, a 48 diameter splice may be provided at that point.
- G. Top horizontal stem bars shall be continuous through bends and corners.
- H. Horizontal stem bars shall be placed from the bottom course to the maximum specified spacing. Double bars shall be provided where indicated.
- I. Reinforcing bends and standard hooks shall conform to applicable code.
- J. No field welding of reinforcement shall be allowed without permitting agency approval

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

#### **A. Materials**

1. Masonry units shall be sound, dry, and clean from all foreign matter when placed in the wall.
2. Reinforcement bars shall be free of kinks or bends, except for bends detailed in the drawings.

#### **B. Layout and Foundation**

1. All footings shall be poured against undisturbed natural soil or certified compacted fill. Any over excavation and backfill shall be inspected by the field geotechnical engineer.
2. All excavation, backfill and bearing strata shall be inspected and approved by the field geotechnical engineer.
3. Temporary shoring or another approved construction method is required for excavations, which remove the lateral support from a public way or existing structure. Separate temporary shoring approval is required.
4. Retaining portion of wall shall be drained as detailed on the plans. Swales and minors drainage devices shall be constructed per the grading and drainage plan.
5. If site conditions or layout is in any way improper, masonry work shall not begin until cleared by the governing authority.
6. Foundation shall be level and at correct grade so that the initial bed joint shall not be less than 1/4 inch nor more than 1 inch.
7. Surface of foundation shall be clean and free of deleterious materials. Surface shall be roughened to a full amplitude of 1/16 inch.
8. If a foundation dowel must be bent to align with a vertical cell, it shall not slope more than 1 inch horizontally to 6 inches vertically.
9. All footings shall be poured against undisturbed natural soil or certified compacted fill. Any over excavation and backfill shall be inspected by the field geotechnical engineer.
10. All excavation, backfill and bearing strata shall be inspected and approved by the field geotechnical engineer.
11. Temporary shoring or another approved construction method is required for excavations, which remove the lateral support from a public way or existing structure. Separate temporary shoring approval is required.
12. Retaining portion of wall shall be drained as detailed on the plans. Swales and minors drainage devices shall be constructed per the grading and drainage plan.

### **3.2 MIXING OF MORTAR**

**A. Spec Mix Pre-blended Mortar**

1. Mix in a mechanical batch mixer with the minimum amount of water to produce a workable consistency.
2. Mortar may be re-tempered once to maintain plasticity and workability. Re-tempering on mortar boards shall be done by adding water within a basin formed within the mortar. Rework the mortar into the water. No mortar shall be used beyond 2 1/2 hours from the time it was originally mixed.

**3.3 MIXING OF GROUT**

- A. Water content of the grout shall be adjusted to provide proper fluid consistency to enable placement under existing field conditions without segregation of the constituents.**
- B. Do not use grout more than 1 1/2 hours after initial mixing.**
- C. Pre-blended Grout**
1. Mix in mechanical mixer until workable, but not to exceed 10 minutes.

**3.4 INSTALLATION OF MASONRY UNITS**

- A. General**
1. All masonry shall be laid true, level, plumb, and in accordance with the plans.
  2. Units shall be laid in running bond unless otherwise shown on the drawings.
  3. Cutting of units shall be neat, true, and made by masonry saw.
  4. Concrete masonry units shall not be wetted unless otherwise approved.
  5. Construction supports shall not be attached to the wall except where specifically permitted by the architect or engineer.
- B. Protection**
1. Extreme care shall be taken to prevent grout or mortar stains on exposed surfaces. Any mortar or grout contact shall be cleaned immediately.
  2. Tops of all unsheltered walls and partially completed walls shall be covered when work is not in progress.

**3.5 JOINTS**

- A. Mortar Joints**
1. Initial bed joint shall not be less than 1/4 inch nor more than 1 inch in thickness. All cells to be filled with grout shall be kept free from mortar droppings so the grout will make full contact with the foundation.
  2. Head and bed joints of hollow units shall be filled with mortar for the thickness of the face shell. Solid units shall have full head and bed joints.
  3. Horizontal joint reinforcement shall be fully embedded in mortar with a minimum 5/8 inch cover between joint reinforcement and exposed face. Mortar joints with wire reinforcement shall be at least twice the thickness of the wire diameter.
  4. All mortar joints on exposed walls, unless otherwise specified, shall be concave and double struck to produce a dense, slightly concave surface well bonded to the surface of the masonry unit.
  5. Flush cut or sacked joints shall be used where surface is to be plastered.

6. If an installed unit is moved, it shall be removed from the wall, cleaned, and set in fresh mortar.
7. For glazed masonry units, rake back exterior mortar joints a minimum of 1/4 inch and tuckpoint with an approved water-resistant grout.
8. Tuckpoint scored joints of glazed masonry units with an approved water-resistant grout.

**B. Control Joints**

1. Control Joints control cracks by providing a vertical stress-relieving joint in the masonry wall while maintaining adequate shear strength for lateral wall stability.
2. Control joints shall be installed at 24 feet on center, unless noted otherwise in the drawings.
3. Control joints shall be constructed as detailed in the drawings.
4. PVC Masonry Control Joint: Use those classified by ASTM D 2287-81. The material shall meet or exceed the minimum requirements when tested in accordance with the stated test methods.
5. Synthetic Rubber Masonry Control Joint: Use those classified by ASTM D 2000-92. The material shall meet or exceed the minimum requirements when tested in accordance with the stated test methods.

### **3.6 INSTALLATION OF REINFORCING STEEL**

- A. Reinforcement shall be placed as detailed on the drawings and secured against displacement at intervals not to exceed 200 bar diameters.**

**B. Tolerance for placement:**

1. In flexural elements shall be  $\pm 1/2$  inch for  $d$  equal to 8 inches or less,  $\pm 1$  inch for  $d$  equal to 24 inches or less but more than 8 inches,  $\pm 1 1/4$  inches for  $d$  greater than 24 inches. ( $d$  is the distance from compression face of flexural member to the centroid of tensile reinforcement.)

2. Longitudinal location shall be  $\pm 2$  inches.

- C. Reinforcing bars, except joint reinforcement, shall be completely embedded in mortar or grout and have a minimum cover, including the masonry unit, of at least 3/4 inch, 1 1/2 inches when exposed to weather, and 2 inches when exposed to soil.**

- D. Clear distance between surface of reinforcing bar and any surface of a masonry unit**

shall not be less than 1/4 inch for fine grout and 1/2 inch for course grout.

1. Horizontal reinforcement bars may rest on the cross webs of hollow masonry units.

- E. Reinforcing bars and wire joint reinforcement shall be lapped as indicated on the drawings.**

### **3.7 GROUTING**

**A. General**

1. Reinforcement bars shall be in place and secured prior to grouting.

2. All cells and areas where grout is to be placed shall be free from mortar fins greater than 1/2 inch, droppings, and foreign materials that would prevent the wall from being properly grouted.
  3. Grout shall completely fill all designated spaces, and shall be confined to those spaces.
  4. Segregation of grout materials and damage to the masonry shall be avoided during the grouting process.
  5. Grout shall be consolidated before loss of plasticity.
    - a. Grout pours 12 inches or less may be puddled.
    - b. Grout pours greater than 12 inches shall be consolidated and reconsolidated by mechanical vibration using a low velocity vibrator with a maximum head diameter of 3/4 inch.
  6. Stop grout pours 1 1/2 inches below top of wall. Where bond beams occur, stop grout a minimum of 1/2 inch below.
  7. Structural masonry walls shall be solid grouted unless otherwise specified. Anchor bolts shall be solidly grouted in place with 1 inch minimum of grout between the bolt and the masonry.
  8. Spaces around all metal door frames and other built-in items shall be solidly grouted.
- B. Low Lift Grouting
1. Grout pours shall not exceed 5 feet. Cleanouts are not required.
- C. High-Lift Grouting:
1. Cleanout holes shall be provided at the bottom of all cells containing vertical reinforcement in hollow unit masonry, but spaced not more than 32 inches on center. Grout shall be placed in lifts not to exceed 6 feet. The full height in each wall section shall be poured in 1 day with no interruption greater than 1 hour.

### **3.8 WALL CLEANING AND PROTECTION**

- A. Minimize any mortar or grout stains on the wall during construction. Any stains that occur shall be removed immediately.
1. For burnished concrete masonry units, immediately remove any green mortar smears or soiling with a damp sponge.
  2. For glazed masonry units and ground face units with heat-treated acrylic finish, remove green mortar smears with a dry cloth. Do not allow mortar lumps or smears to harden on the finished surfaces.
- B. The tops of all unsheltered walls and partially completed walls shall be covered when work is not in progress.
- C. Where atmosphere is dry, a light fog spray may be applied to masonry surfaces for three days after construction.



- D. At the conclusion of the masonry work, remove all scaffolding and equipment used during construction, and remove all debris, refuse, and surplus masonry material from the site.
- E. Walls of ground face units with heat-treated acrylic finish, when completed, and after final cleaning, shall receive a field coat application of Trendcoat T1 acrylic, from Trenwyth Industries, Inc., or approved equal, per manufacturer's instructions.
- F. Retaining walls shall not be backfilled until materials have attained design strength.

### **3.9 CONSTRUCTION TOLERANCES**

- A. Variation from Level: For bed-joint lines along walls, do not exceed 1-1/4 inches in 10 feet, 3 inches maximum.
- B. Variation from Indicated Wall Line: For walls indicated as straight, do not vary from straight line by more than 1-1/4 inches in 10 feet.

### **4.0 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Comply with requirements in Division 2 Section "Earthwork" for field quality control.
- C. In each compacted backfill layer, perform at least 1 field in-place compaction test for each 100 feet or less of site retaining wall length.
- D. In each compacted backfill layer, perform at least 1 field in-place compaction test for each 24 inches of fill depth and each 50 feet or less of site retaining wall length.

### **4.1 ADJUSTING**

- A. Remove and replace site retaining CMU wall construction of the following descriptions:
  - 1. Broken, chipped, stained, or otherwise damaged units. Units may be repaired if Architect approves methods and results.
  - 2. Site retaining walls that do not match approved Samples and mockups.
  - 3. Site retaining walls that do not comply with other requirements indicated.
- B. Replace units so site retaining wall matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.

**END OF SECTION 32 32 19**

