

ADDENDUM NO. 1
TO THE
PLANS AND SPECIFICATIONS
FOR
JEFFERSON LAB
TECHNICAL ENGINEERING & DEVELOPMENT FACILITY
(TEDF)

Newport News, Virginia

EwingCole
Architects.Engineers.Interior Designers.Planners
Federal Reserve Bank Building
100 N. 6th Street
Independence Mall West
Philadelphia, Pennsylvania 19106
215-923-2020

Addendum No. 1
Project No. 20080400
February 12, 2010

The following changes shall become part of the Contract and shall supersede anything called for previously in the Specifications or shown on the Contract Drawings with which they may be at variance. This Addendum shall be a part of and attached to the Specifications.

I. NEW SPECIFICATION SECTIONS

The following new specification sections are hereby issued this date:

| | |
|----------|------------------------|
| 07 42 13 | METAL WALL PANELS |
| 08 33 23 | OVERHEAD COILING DOORS |
| 08 90 00 | LOUVERS AND VENTS |
| 09 91 13 | EXTERIOR PAINTING |
| 09 91 23 | INTERIOR PAINTING |

END OF ADDENDUM NO. 1

Jefferson Lab Technical Engineering & Development Facility (TEDF)

SPECIFICATION MATRIX

SPECIFICATIONS DATED: February 12, 2010

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| DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS | | | | | | | | | |
| 00 20 00 | INFORMATION FOR BIDDERS | • | | | | | | | |
| 00 85 00 | DRAWING LIST | • | | | | | | | |
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| 01 21 00 | ALLOWANCES | • | | | | | | | |
| 01 23 00 | ALTERNATES | • | | | | | | | |
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| 01 32 33 | PHOTOGRAPHIC DOCUMENTATION | • | | | | | | | |
| 01 33 00 | SUBMITTAL PROCEDURES | • | | | | | | | |
| 01 35 29 | SAFETY AND HEALTH REQUIREMENTS | • | | | | | | | |
| 01 40 00 | QUALITY REQUIREMENTS | • | | | | | | | |
| 01 41 00 | TESTING LABORATORY SERVICES (FOR INFORMATION ONLY) | • | | | | | | | |
| 01 42 00 | REFERENCES | • | | | | | | | |
| 01 50 00 | TEMPORARY FACILITIES AND CONTROLS | • | | | | | | | |
| 01 56 39 | TEMPORARY TREE AND PLANT PROTECTION | • | | | | | | | |
| 01 57 19 | TEMPORARY ENVIRONMENTAL CONTROLS | • | | | | | | | |
| 01 60 00 | PRODUCT REQUIREMENTS | • | | | | | | | |
| 01 73 29 | CUTTING AND PATCHING | • | | | | | | | |
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| 01 77 00 | CLOSEOUT PROCEDURES | • | | | | | | | |
| 01 78 23 | OPERATION AND MAINTENANCE DATA | • | | | | | | | |
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| 01 79 00 | DEMONSTRATION AND TRAINING | • | | | | | | | |
| 01 81 13 | SUSTAINABLE DESIGN REQUIREMENTS | • | | | | | | | |
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| 07 42 13 | METAL WALL PANELS | | • | | | | | | |
| 07 54 16 | ETHYLENE INTERPOLYMER (KEE) ROOFING | • | | | | | | | |
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| 07 95 00 | EXPANSION CONTROL | | | | | | | | |
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| 08 31 13 | ACCESS DOORS AND FRAMES | | | | | | | | |
| 08 33 23 | OVERHEAD COILING DOORS (FYI ONLY) | | • | | | | | | |
| 08 41 13 | ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS | | | | | | | | |
| 08 41 26 | ALL-GLASS ENTRANCES AND STOREFRONTS | | | | | | | | |
| 08 44 13 | GLAZED ALUMINUM CURTAIN WALLS | | | | | | | | |
| 08 63 00 | METAL-FRAMED SKYLIGHTS | | | | | | | | |
| 08 71 00 | DOOR HARDWARE | | | | | | | | |
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| 09 51 13 | ACOUSTICAL CEILINGS | | | | | | | | |
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| 09 65 13 | RESILIENT BASE AND ACCESSORIES | | | | | | | | |
| 09 65 16 | RESILIENT FLOORING | | | | | | | | |
| 09 66 23 | RESINOUS MATRIX TERRAZZO FLOORING | | | | | | | | |
| 09 66 80 | VINYL ESTER LINING | • | | | | | | | |
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| 23 21 23 | HVAC PUMPS | | | | | | | | |
| 23 22 13 | STEAM AND CONDENSATE PIPING SYSTEMS | | | | | | | | |
| 23 24 13 | UNDERGROUND DISTRIBUTION PIPING SYSTEMS | • | | | | | | | |
| 23 25 00 | HVAC WATER TREATMENT | | | | | | | | |
| 23 30 01 | DUCTWORK AND DUCTWORK ACCESSORIES | • | | | | | | | |
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| 23 41 00 | AIR FILTRATION | | | | | | | | |
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| 23 57 00 | HEAT EXCHANGERS | | | | | | | | |
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| 26 05 33 | RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS | • | | | | | | | |
| 26 05 36 | CABLE TRAYS FOR ELECTRICAL SYSTEMS | | | | | | | | |
| 26 05 43 | UNDERGROUND DUCTS AND STRUCTURES FOR ELECTRICAL SYSTEMS | • | | | | | | | |
| 26 05 48 | VIBRATION AND SEISMIC RESTRAINTS FOR ELECTRICAL SYSTEMS | | | | | | | | |
| 26 05 53 | IDENTIFICATION FOR ELECTRICAL SYSTEMS | • | | | | | | | |
| 26 05 73 | ELECTRICAL SYSTEMS STUDIES AND ANALYSIS | | | | | | | | |
| 26 09 13 | ELECTRICAL POWER MONITORING AND CONTROL | | | | | | | | |
| 26 09 23 | LIGHTING CONTROL DEVICES | • | | | | | | | |

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| 26 13 00 | MEDIUM-VOLTAGE SWITCHGEAR | • | | | | | | | |
| 26 22 00 | LOW-VOLTAGE TRANSFORMERS | • | | | | | | | |
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| 26 24 16 | PANELBOARDS | • | | | | | | | |
| 26 24 19 | MOTOR-CONTROL CENTERS | | | | | | | | |
| 26 27 13 | ELECTRICITY METERING | | | | | | | | |
| 26 27 26 | WIRING DEVICES | • | | | | | | | |
| 26 28 13 | FUSES | • | | | | | | | |
| 26 28 16 | ENCLOSED SWITCHES AND CIRCUIT BREAKERS | • | | | | | | | |
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| 26 32 13 | ENGINE GENERATORS | | | | | | | | |
| 26 36 00 | TRANSFER SWITCHES | | | | | | | | |
| 26 41 13 | LIGHTNING PROTECTION FOR STRUCTURES | • | | | | | | | |
| 26 43 13 | TRANSIENT-VOLTAGE SUPPRESSION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS | • | | | | | | | |
| 26 51 00 | INTERIOR LIGHTING | • | | | | | | | |
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| DIVISION 27 - COMMUNICATIONS | | | | | | | | | |
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| 27 11 00 | COMMUNICATIONS EQUIPMENT ROOM FITTINGS | • | | | | | | | |
| 27 13 00 | COMMUNICATIONS BACKBONE CABLING | • | | | | | | | |
| 27 15 00 | COMMUNICATIONS HORIZONTAL CABLING | • | | | | | | | |
| 27 51 16 | PUBLIC ADDRESS AND MASS NOTIFICATION SYSTEMS | | | | | | | | |
| 27 51 23 | INTERCOMMUNICATIONS AND PROGRAM SYSTEMS | | | | | | | | |
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| 31 10 00 | SITE CLEARING | • | | | | | | | |
| 31 20 00 | EARTH MOVING | • | | | | | | | |
| 31 23 19 | DEWATERING | • | | | | | | | |
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| 32 12 16 | ASPHALT PAVING | • | | | | | | | |

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| 32 13 13 | CONCRETE PAVING | • | | | | | | |
| 32 14 00 | UNIT PAVING | • | | | | | | |
| 32 31 13 | CHAIN LINK FENCES AND GATES | • | | | | | | |
| 32 92 00 | TURF AND GRASSES | • | | | | | | |
| 32 93 00 | PLANTS | • | | | | | | |
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| 33 41 00 | STORM UTILITY DRAINAGE PIPING | • | | | | | | |
| 33 46 00 | SUBDRAINAGE | | | | | | | |
| 33 63 13 | UNDERGROUND UTILITY DISTRIBUTION STRUCTURES | • | | | | | | |
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| 41 22 00 | HOISTS AND CRANES | | | | | | | |

SECTION 07 42 13 - METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This project is a LEED project. Section 01 81 13 - Sustainable Design Requirements must be referenced.
- B. Section Includes:
 - 1. Insulated metal wall panel system
 - 2. Metal wall panel support system specified in Section 05 "Cold Formed and Structural Steel"
 - 3. All accessories including coping, flashing, and all trim pieces
- C. For products applied on site - The VOC content of adhesives, sealants and sealant primers shall be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168 and all sealants used as fillers must meet or exceed the requirements of the Bay Area Quality Management District Regulation 8, rule 51.
- D. Related Sections:
 - 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements
 - 2. Division 05 Section - "Cold-Formed Metal Framing"
 - 3. Division 05 Section - "Structural Steel Framing"
 - 4. Division 05 Section - "Metal Fabrications"
 - 5. Division 06 Section - Rough Carpentry
 - 6. Division 07 Section - "Fluid Applied Membrane Air and vapor Barrier (AVB)" and "Fluid Applied Vapor Permeable Membrane Air Infiltration Barrier (AIB)"
 - 7. Division 07 Section - "Sheet Metal Flashing and Trim"
 - 8. Division 07 Section - "Thermal Insulation"
 - 9. Division 07 Section - "Joint Sealants"

1.3 DEFINITION

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight wall system.

1.4 REFERENCES

- A. AAMA 501.1 - Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
- B. AAMA 501.2 - Storefronts, Curtain Walls, and Sloped Glazing Systems
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum
- D. AAMA 620 - Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates
- E. AAMA 2605 - Specification for Superior High Performance Organic Coatings on Architectural Extrusions and Panels
- F. American Institute of Steel Construction (AISC) Manual of Steel Construction (Current Edition)
- G. American Iron and Steel Institute (AISI), Specification for the Design of Cold-Formed Steel Structural Members (August, 1986)
- H. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
- I. ASTM A 240/A 240M - Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- J. ASTM A 606 - Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, with Improved Corrosion Resistance
- K. ASTM A 641/A 641M - Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- L. ASTM A 653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- M. ASTM A 755 - Standard Specification for Steel Sheet, metallic Coated by the Hot-dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
- N. ASTM A 792 - Grade 33 (230), Structural Quality Steel Sheet, Aluminum-Zinc Alloy-Coated by the Hot-dip Process, General Requirements for Galvalume
- O. ASTM A 924 - Steel Sheet, Metallic Coated by the Hot-Dip Process
- P. ASTM B 117 - Test Method of Salt Spray (Fog) Testing
- Q. ASTM B 209 - Aluminum-Alloy Sheet and Plate
- R. ASTM B 370 - Specification for Copper Sheet and Strip for Building Construction
- S. ASTM B 882 - Specification for Pre-Patinated Copper for Architectural Applications
- T. ASTM C 423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

- U. ASTM C 578 - Specification for Rigid, Cellular Polystyrene Thermal Insulation
- V. ASTM C 591 - Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
- W. ASTM C 612 - Specification for Mineral Fiber Block and Board Thermal Insulation
- X. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members
- Y. ASTM C 653 - Standard Guide for Determination of the Thermal Resistance of Low Density Blanket - Type Mineral Wool Insulation
- Z. ASTM C 665 - Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- AA. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
- BB. ASTM C 920 - Specification for Elastomeric Joint Sealants
- CC. ASTM C 991 - Specification for Flexible Glass Fiber Insulation for Metal Building
- DD. ASTM C 1136 - Specification for Flexible, Low permeance Vapor Retarders for Thermal Insulation
- EE. ASTM C 1289 - Specification for Faced Rigid Cellular Polyisocyanurate Thermal insulation Board
- FF. ASTM C 1311 - Standard Specification for Solvent Release Sealants
- GG. ASTM D 523 - Test Method for Specular Gloss
- HH. ASTM D 659 - Method for Evaluating Degree of Chalking of Exterior Paints
- II. ASTM D 822 - Practice for Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus
- JJ. ASTM D 968 - Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
- KK. ASTM D 1308 - Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
- LL. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics
- MM. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
- NN. ASTM D 2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
- OO. ASTM D 2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- PP. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films

- QQ. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- RR. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials
- SS. ASTM E 96el - Test Methods for Water Vapor Transmission of Materials
- TT. ASTM E 119 - Test Methods for Fire Tests of Building Construction and Material
- UU. ASTM E 283 - Test for Rate of Air Leakage Through Exterior Windows, Curtain Wall, and Doors
- VV. ASTM E 329-05 - Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- WW. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Wall and Doors by Uniform Static Air Pressure Difference
- XX. ASTM E 1105-00 - Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
- YY. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
- ZZ. ASTM G 23 - Practice for Operating Light-Exposure Apparatus (Carton-Arc Type) with and without Water for Exposure of Nonmetallic Materials
- AAA. ASTM G 53 - Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV Condensation Type) for Exposure of Nonmetallic Materials
- BBB. National Association of Architectural Metal Manufacturers - Metal Finishes Manual for Architectural and Metal Products
- CCC. SEI/ASCE 7 - Minimum Design Loads for Buildings and Other Structures
- DDD. SMACNA
- EEE. Underwriters Laboratories (UL) - Fire Resistance Directory (Current Issue)
- FFF. LEED - USGBC (United States Green Building Council)
- GGG. SCAQMD - South Coast Air Quality Management District

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal wall panel assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Design metal wall panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated, registered in the state where the project is located.

- C. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at the following test-pressure difference:
1. Test-Pressure Difference: 6.24 lbf/sq. ft.
- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
1. Test-Pressure Difference: 10 lbf/sq. ft.
- E. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of the design loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
1. Dead Loads: Account for weight of storefront window system at conditions where window system bears on metal wall panel assembly.
 2. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure as indicated on Drawing SG.3.
 - b. Account for wind loads from storefront window system where connections are made to metal wall panel assembly.
 3. Deflection Limits: Metal wall panel assemblies shall withstand wind loads with horizontal deflections no greater than 1/180 or 3/4 inch maximum, whichever is less, of the span.
 4. Movement of Structural Frame: Design components and connections to accommodate movement of structural frame as listed below:
 - a. Story Drift
 - 1) Accommodate design displacement of adjacent stories equal to 1/400 of span between supports.
 - b. Deflection at midspan of supporting members
 - 1) Accommodate vertical downward deflection of 1/720 of the span with a maximum of 0.5 inches under live load conditions.
 5. Metal Wall Panel Support System: Design of the metal wall panel support system shall be by the metal wall panel system manufacturer who shall employ a licensed structural engineer in the Commonwealth of Virginia to design the panel support system, provide required structural calculations and stamp and seal all necessary submittal drawings.
 - a. Connections and anchorage shall be designed to provide adjustability for final alignment in accordance with Section 7 or the latest edition of AISC Manual of Steel Construction and/or ACI 301 specification for structural concrete.
 - b. The maximum allowable girt steel deviation from a theoretical girt plane is $\pm 1/2$ inch. In any 20 foot length horizontally or vertically, this deviation cannot vary more than 1/4 inch. Transition areas such as corners and soffits shall have girt steel $\pm 1/8$ inch of the theoretical girt plane.

- c. Metal panel wall system shall consist of tubular steel shapes prime painted which fulfill all structural requirements as well as fastening and sealing requirements of the metal wall panel manufacturer.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- G. Design exterior metal wall and support system and connections to accommodate, by means of expansion joints, movement in structure and between cladding elements and structure without permanent distortion, damage to components, wracking of joint connections or breakage of seals.
- H. Insulated Metal Panel System
 - 1. Building Code and Insurance Acceptance - minimum requirements
 - a. Wall units shall be qualified by laboratory scale and/or full scale fire tests for acceptance by building codes and insurance authorities for use where nonload bearing, noncombustible wall construction is permitted based on fire test performance. The foam plastic insulation requirements of the model building codes
 - Flame Spread: 25 or less
 - Smoke Developed: 450 or less
 - b. Evidence of fire performance must be submitted and must include recognition under the following:
 - 1) UL, Inc. Classified "Surface Burning Characteristics" per UL Standard 723 (ASTM E 84)
 - 2) UL, Inc. Classified "Building Units for Interior Building Construction" per UL Standard 1715
 - 3) UL, Inc. Classified as component of fire resistance rated nonload-bearing wall assembly designs per UL Standard 263
 - 4) Factory Mutual Research Corp. Approved per FM Standard 4880, Class 1, insulated wall and/or ceiling panels, subject to conditions of approval as a Building Panel when installed as described in the current edition of the FMRC Approval Guide
 - 5) UBC 26-4 Method of test for evaluation of flammability characteristics of exterior nonload-bearing wall panel assemblies using foam plastic insulation
 - 6) Ignition Temperature Test of foam plastic insulation per ASTM D 1929
 - 2. Structural Tests: Structural design for windloads shall be derived from witnessed test per ASTM E72 "Chamber Method" using the project required positive or negative loading. A deflection limit of L/180 shall apply to positive load only. Loading tests that rely on back-fastening to obtain designated results are not allowed.
 - 3. Thermal Properties: Units tested per ASTM C 236 standard panel module (36 inch) shall provide at least an "R" value of 14 for 2 inch thick horizontal panels, and also for the foamed-in-place back up panel.

4. Air Infiltration: Shall not exceed .06 CFM/FT2 air leakage under a static pressure of 1.56 psf when tested in accordance with ASTM E 283.
5. Water Infiltration: No uncontrollable water penetration through the standard horizontal vertical joints at a static pressure of 6.24 psf when tested in accordance with ASTM E 331.
6. Fatigue Test: There shall be no evidence of metal/foam interface delamination when the panel is tested by simulating wind loads of 20 psf, positive and negative, for two million alternate cycles. Test results must be verified by an independent testing facility.
7. Rain Screen Test for Horizontal Panels: With liner side seal broken, there shall be no water rise in the horizontal joint cavity under 10 psf and in accordance with ASTM E 331.

1.6 SUBMITTALS

A. LEED Submittals:

1. Provide LEED information in form as required by LEED. Also provide Green Building Materials Certification Form attached to Section 01 81 13.
2. MR 4.1 and 4.2 - Manufacturers' certification of percentage by weight of both pre-consumer and post-consumer recycled content in each of their products to be incorporated in this project.

B. Product Data:

1. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of wall panel and accessory.
2. The metal panel manufacturer must provide information showing that metal panel acts as an air and vapor barrier, at all joints, transitions, etc. and shall certify the same.

C. Certification Letters

1. The Manufacturer's Professional Structural Engineer shall submit a certification letter to the Architect and Owner prior to the submission of the Shop Drawings for metal wall panels. No shop drawings will be reviewed by the Architect prior to the submission and acceptance of this certification letter. The certification letter shall include the following:
 - a. Signature and seal of the registered Professional Structural Engineer (registered in the State in which the work is being performed).
 - b. Statement that the Professional Structural Engineer is fully experienced in the design of metal wall panel systems.
 - c. Statement that all metal wall panel shop drawings (including all supports, connections and components) have been prepared in accordance with the Contract Document requirements and applicable building codes and under the direction of the Professional Structural Engineer.
 - d. Statement that the Professional Structural Engineer's signature and seal shall appear on all metal wall panel shop drawings (including all supports, connections and components).
 - e. The Manufacturer's Professional Structural Engineer shall submit a letter to the Architect stating that the fabrication and installation of the metal wall panel system has been performed in accordance with his design. This letter shall be signed and sealed by the Manufacturer's Engineer as part of "Project Closeout".

D. Shop Drawings

1. Furnish shop drawings prepared by the product manufacturer, (not the panel contractor), complete with details of all major interfaces and periphery conditions.
2. Shop drawings shall specify and indicate all materials furnished as well as finishes to be applied.
3. These shop drawings shall also serve as field installation drawings and be complete with specific instructions for the application of the products, periphery trim, and all sealants, lapstrips, etc., to insure a weathertight installation.
4. Shop drawings shall be stamped and sealed by a license professional engineer in the state where the project is located employed by the panel manufacturer.
5. Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory-, shop- and field-assembled work.
6. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
 - a. Flashing and trim
 - b. Anchorage systems including methods to seal substrates/ AIB, etc. which are penetrated by anchorage system

E. Calculations: All design calculations (which shall bear the seal and signature of the Manufacturer's Professional Structural Engineer), indicating compliance with the requirements of the design criteria and appropriate codes shall be provided to the Architect concurrent with the submission of shop drawings for record purposes. The Architect will not approve shop drawings for fabrication without receiving design calculations.

F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Wall Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal wall panel accessories.
2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
3. Accessories: 12-inch- long Samples for each type of accessory.

G. Coordination Drawings: Exterior elevations drawn to scale and coordinating penetrations and wall-mounted items. Show the following:

1. Wall panels and attachments.
2. Girts, Stud framing.
3. Wall-mounted items including doors, windows, louvers, and lighting fixtures.
4. Penetrations of wall by pipes and utilities.

H. Qualification Data:

1. The product manufacturer shall have a minimum of 5 years experience in the manufacturer of exterior metal wall system and shall have successfully manufactured a minimum of 10 projects similar to this project.
2. The erector shall have a minimum of 10 years experience in the erection of exterior metal wall system and shall have erected a minimum of 5 projects similar to this project.

- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- J. Field quality-control reports.
- K. Maintenance Data: For metal wall panels to include in maintenance manuals.
- L. Warranties: Sample of special warranties.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Metal wall system contractor shall have completed a minimum of five metal wall panel projects similar in material, design and extent to that indicated for this project with a record of successful in-service performance. The metal wall system contractor shall also be able to show a minimum of ten year's experience.
- B. Professional Engineer's Qualifications: A Professional Engineer, who is legally qualified to practice in the Commonwealth of Virginia, and who is experienced in providing engineering services of the kind indicated, shall stamp, and seal all shop drawings, and provide calculations for wind loading for all wall system components.
- C. System Engineering: Engineering (shop drawings) shall only be acceptable from the product manufacturer for the metal wall panel and support system. Shop drawings from metal wall system contractor are NOT acceptable. Shop drawings for all wall panels, panel support system and louvers shall be submitted by one manufacturer at one time as a complete submittal package.
- D. Statement of Specification Compliance: Both the metal wall system contractor and manufacturer shall submit and sign a statement that all materials supplied for this project shall only be manufactured by the specified manufacturer. It is the intent of this section that the metal wall system be provided as a complete system. Consequently, only materials, (including trim and accessories), supplied by the manufacturer will be accepted, unless specific exceptions are submitted and approved by the Architect.
- E. Source Limitations: Metal wall panel system shall be obtained from a single source, from a single manufacturer, including all accessories.
- F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall and corner panel as shown on Drawings; approximately one bay wide by one story high by full thickness, including insulation, supports, attachments, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- G. Preinstallation Conference: Conduct conference at Project site at least three weeks in advance of metal panel and support installation.

1. Meet with Owner, Architect, Contractor, metal wall panel Installer, metal wall panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal wall panels.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal wall panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal wall panel assembly during and after installation.
8. Review wall panel observation and repair procedures after metal wall panel installation.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal wall panel for period of metal wall panel installation.
- E. Protect insulated panel as follows:
 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 2. Protect against ignition at all times. Do not deliver materials to Project site before installation time.
 3. Complete installation and concealment of foam materials as rapidly as possible in each area of construction.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturers' written instructions and warranty requirements.

- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication, and indicate measurements on Shop Drawings.

1.10 COORDINATION

- A. Coordinate metal wall panel assemblies with rain drainage work, flashing, trim, and construction of girts, studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies including support system that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:

- a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - c. Weather tightness, including air and water infiltration.

- 2. Warranty Period: Five years from date of Substantial Completion.

- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

- 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

- 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness, stretcher leveled, steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Recycled Content: Provide steel sheet with minimum recycled content as indicated below:

| <u>Minimum Pre-Consumer Recycled Content</u> | <u>Minimum Post- Consumer Recycled Content</u> | <u>Minimum Total Recycled Content</u> |
|--|--|---|
| 5% | 14% | 19% |

2. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, Grade 37 G90 coating designation; structural quality.
 3. Exposed Coil-Coated Finish:
 - a. 3-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of 0.2 mil prime coat and 0.8 mil wash coat with a minimum total dry film thickness of 1.0 mil.
- B. Panel Gaskets and Sealants: Type required by metal panel manufacturer for use within panel system to provide weather tightness.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 2. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.
 3. Joint Gasket - Extruded, tape as provided by panel manufacturer.
 4. To be installed in both tongue and groove joinery.

2.2 RECYCLED CONTENT

- A. Refer to Section 01 81 13 Sustainable Design Requirements for requirements of the LEED Action Plan and other LEED requirements.
- B. Product for this project shall contain a minimum amount of recycled content by weight.

2.3 MISCELLANEOUS METAL FRAMING

- A. Miscellaneous Metal Framing, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G90 hot-dip galvanized.
- B. Subgirts: Manufacturer's standard C- or Z-shaped sections, minimum 16 gauge nominal thickness, or thicker as required by design.

- C. Zee Clips: minimum 16 gauge nominal thickness.
- D. Base or Sill Angles Channels: minimum 16 gauge nominal thickness.
- E. Hat-Shaped, Rigid Furring Channels:
- F. Z-Shaped Furring: With nonslotted web, flanges of 1-1/4 inches, and depth required to fit insulation thickness indicated.
 - 1. Nominal Thickness: As required to meet performance requirements minimum 16 gauge or heavier.
- G. Fasteners for Miscellaneous Metal Framing: Stainless steel of type, size, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

2.4 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.

2.5 INSULATED METAL WALL PANEL SYSTEM

- A. Insulated Metal Wall Panel System - Exterior profiled insulated wall panels.
 - 1. Wall Panel Factory Assembly, Profile, Module and Joinery:
 - a. 2 inch and 3 inch thick with module as detailed on contract drawings.
 - b. Tongue and groove, shiplap side joint design with fasteners concealed within side joint. Concealed design shall fully capture face and liner sheets.
 - c. Module tolerance plus 1/16 inch or minus 1/8 inch adjustment feature.
 - d. Interior female joints factory caulked.
 - e. Horizontal application face design shall have nominal 1/2 inch capillary break and sloped drain shelf to create the rain screen effect and a pressure equalization chamber. The nominal gutter height shall be 2-1/4 inches.
 - f. Where so indicated on drawings, trimless or closed end panels shall be factory fabricated and utilize a field installed recessed, dry gasket in lieu of exposed wet sealants or battens. Field fabrication of trimless end on horizontal panels will NOT be accepted.
 - g. Trim shown on the architectural drawings, including sill and reveal trim, and copings shall be made of extruded aluminum: Trim shall be painted to match adjacent panels unless indicated to be a different color on the architectural drawings. All trim splice joints are to be clearly shown on the manufacturer's submittal drawings, and it is the design intent that splice joints are only to occur at vertical panel joints.
 - h. Concealed fasteners and clip assemblies shall be provided in type as recommended and furnished by the manufacturer.
 - i. All panel corners shall be trimless, and factory made by the metal wall panel manufacturer, not the metal wall panel contractor.

- j. Panels shall provide nominal, thermal resistance of $R=7.2$ per inch of thickness.
- 2. Panel Design
 - a. Exterior Face Sheet Material: ASTM A 653, Grade 37, 22 gauge steel with zinc coating conforming to designation G-90, smooth finish.
 - b. Liner Material: ASTM A 653, Grade 37, 26 gauge steel coating conforming to designations G-90. Liner shall be planked and nondirectionally embossed.
- 3. Finish/Color
 - a. Interior Metal Liner - finish 0.2 mil primer plus 0.8 mil acrylic in standard arctic ice white color.
 - b. Panel Finish - Exterior metal panel material shall be factory coil coated.
 - 1) Exterior Finish: 3-coat fluoropolymer containing not less than 70% PVDF resin in color and topcoat, complying with AAMA 2605.
 - 2) Color: Match Architect's samples.
- 4. Basis-of-Design Product:
 - a. King Span KS Series: KS42 Micro-Rib Architectural panel style with hidden fasteners.
 - b. King Span KS Series: KS36 Flat embossed architectural panel style with hidden fasteners.

2.6 ACCESSORIES

- A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal wall panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- B. Flashing and Trim: Extruded Aluminum as noted or drawings or formed from same material and gauge as wall panels, zinc-coated, G90 (galvanized) steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels. Provide manufacturer's standard extruded aluminum trim pieces, including at jambs, sills, copings, etc.,

finish to match wall panels, indicated on the drawings, at insulated metal/panels and interlocking profile panels.

2.7 FABRICATION

- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal wall panel joints with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, and that will minimize noise from movements within panel assembly.
- E. Panels shall be fabricated foamed in place wall panels between metal facer and backer sheets. Insulated panels shall be fabricated with a double tongue and groove lap joint and butt side joints whereby a capillary break and pressure equalized joint design is achieved.
- F. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.
- G. Extruded Panel Trim: Fabricate trim and accessories from extruded aluminum, for panel systems where indicated, and where required as part of manufacturer's standard system.
- H. Manufacture exterior metal wall system to ensure similarity of dimension and finish throughout.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with AAMA for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.9 VAPOR BARRIER CONTINUITY

- A. The Contractor shall provide a continuous vapor barrier as part of the building enclosure including the slab-on-grade. In order to maintain the building's vapor performance extend the adjacent vapor barrier component such that it overlaps the inner liner of the insulated metal panels. Seal the barrier to the panel with the appropriate pressure sensitive tape or by the adhesion of the fluid applied barrier.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine structure, substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.
 - 1. Examine wall support and framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 - 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal wall panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorages according to ASTM C 754 and metal wall panel manufacturer's written recommendations.

3.3 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panel's perpendicular to girts and subgirts unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Installation shall be performed by qualified erectors approved by the metal panel manufacturer.
 2. Shim or otherwise plumb substrates receiving metal wall panels.
 3. Flash and seal metal wall panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by metal wall panels are installed.
 4. Install screw fasteners in predrilled holes.
 5. Locate and space fastenings in uniform vertical and horizontal alignment.
 6. Install flashing and trim as metal wall panel work proceeds.
 7. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 8. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
 9. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 10. Provide weathertight escutcheons for pipe and conduit penetrating exterior walls.
- B. Fasteners:
1. Wall Panels: Use stainless-steel fasteners for all panel attachment to substrate.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by metal wall panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.
1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.
- E. Lap-Seam Metal Wall Panels: Fasten metal wall panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Lap ribbed or fluted sheets minimum one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal wall panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

5. Provide sealant tape at all lapped joints of metal wall panels and between panels and protruding equipment, vents, accessories and flashings.
 6. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps; on side laps of nesting-type panels; on side laps of corrugated nesting-type, ribbed, or fluted panels; and elsewhere as needed to make panel's weathertight.
 7. At panel splices, nest panels with minimum 6-inch end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.
 8. Install foam and metal panel end closures at panel ends, under flashings and trim.
- F. Zee Clips: Provide Zee clips of size indicated or, if not indicated, as required to act as standoff from sheathing for thickness of insulation indicated. Attach to subgirts with fasteners.

3.4 ACCESSORY INSTALLATION

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

3.5 CLEANING AND PROTECTION

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

END OF SECTION 07 42 13

SECTION 08 33 23 - OVERHEAD COILING DOORS (FOR INFORMATION ONLY)

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 project is a LEED project. Section 01 81 13 - Sustainable Design Requirements must be referenced.
- B. This Section includes the following types of manually and electric-motor-operated overhead coiling doors:
 - 1. Service doors.
 - 2. Insulated service doors.
 - 3. Fire-rated service doors.
 - 4. Fire shutters.
- C. Related Sections include the following:
 - 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements.
 - 2. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.
 - 3. Division 08 Section "Door Hardware" for lock cylinders and keying.
 - 4. Division 09 painting Sections for field-applied paint finish.
 - 5. Division 11 Section "Parking Control Equipment" for parking control equipment interlocked to overhead coiling doors.
 - 6. Division 26 Sections for electrical service and connections for powered operators and accessories.
 - 7. Division 28
 - 8. All architectural components shall be in accordance with the seismic requirements of the governing codes: refer to Division 1.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:
 - 1. Wind Load for Wall Corner: As indicated on structural drawing sheet SG.3.

- B. Operation-Cycle Requirements: Provide overhead coiling door components and operators capable of operating for not less than 20,000 cycles.
 - 1. Include tamperproof cycle counter.

1.4 SUBMITTALS

A. LEED Submittals

- 1. Provide LEED information in form as required by LEED. Also provide Green Building Materials Certification Form attached to Section 01 81 13.
- 2. MR 4.1 and 4.2 - Manufacturers' certification of percentage by weight of both pre-consumer and post-consumer recycled content in each of their products to be incorporated in this project.
- 3. MR 5.1 and 5.2 - Manufacturers' certification that location of extraction and of manufacturing of each portion of each of their products to be incorporated in this project is within 500 miles of the project site.

B. Product Data: For each type and size of overhead coiling door and accessory. Include the following:

- 1. Summary of forces and loads on walls and jambs.
- 2. Fire-Rated Doors: Include description of fire-release system including testing and resetting instructions.

C. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's product data.

D. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available for units with factory-applied finishes.

E. Samples for Verification: Of each type of exposed finish required, prepared on Samples of size indicated below.

- 1. Curtain Slats: 12 inches long
- 2. Bottom Bar: 6 inches long
- 3. Guides: 6 inches long
- 4. Brackets: 6 inches square
- 5. Hood: 6 inches square

F. Qualification Data: For Installer

G. Oversize Construction Certification: For door assemblies required to be fire-rated and that exceed size limitations of labeled assemblies.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

- B. Source Limitations: Obtain overhead coiling doors through one source from a single manufacturer. Obtain operators and controls from overhead coiling door manufacturer.
- C. Fire-Test-Response Characteristics: Provide assemblies complying with NFPA 80 that are identical to door and frame assemblies tested for fire-test-response characteristics per UL 10b and NFPA 252, and that are listed and labeled for fire ratings indicated by UL, FMG, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with all standard construction requirements of tested and labeled fire-rated door assemblies except for size.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Cookson Company
- B. Other Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Atlas Door; Div. of Clopay Building Products Company, Inc.
 - 2. Overhead Door Corp.
 - 3. Cornell Iron Works Inc.
 - 4. Mahon Door Corporation
 - 5. McKeon Rolling Steel Door Company, Inc.

2.2 RECYCLED CONTENT

- A. Refer to Section 01 81 13 Sustainable Design Requirements for LEED Action Plan and other related LEED Documentation. Product for this project shall contain a minimum amount of recycled content by weight.

2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling door curtain of interlocking slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel (SS) sheet; complying with ASTM A 653/A 653M, G90 (Z275) coating designation.

- a. Minimum Base-Metal (Uncoated) Thickness: 22 gauge
 - b. Flat profile slats
 - c. Fenestrated slats, 17 percent of total door opening
- 2. Stainless-Steel Door Curtain Slats: ASTM A 666, Type 304.
 - a. Minimum Specified Thickness: Not less than 24 gauge 0.0239 inch
 - b. Flat profile slats
 - c. Fenestrated slats, 17 percent of total door opening.
- 3. Insulation: Fill slat with manufacturer's standard rigid cellular polystyrene or polyurethane-foam-type thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within metal slat faces.
- 4. Inside Curtain Slat Face: To match material of outside metal curtain slat.
- B. Endlocks and Windlocks for Service Doors: Malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Service Doors: Consisting of 2 angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; galvanized, stainless-steel, or aluminum extrusions to suit type of curtain slats.
 - 1. Astragal: Provide a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene; for placement between angles or fitted to shape, as a cushion bumper for interior door.
- D. Curtain Jamb Guides for Service Doors: Fabricate curtain jamb guides of steel angles or channels and angles, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Build up units with not less than 3/16-inch- thick galvanized steel sections complying with ASTM A 36/A 36M and ASTM A 123/A 123M. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

2.4 HOODS AND ACCESSORIES

- A. Hood: Form to act as weatherseal and entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and provide fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sagging.
 - 1. Fabricate hoods for steel doors of minimum 24 gauge 0.0239 inch thick, hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A 653/A 653M.
 - 2. Fabricate hoods for stainless-steel doors of minimum 24 gauge 0.0239 inch thick stainless-steel sheet, Type 304, complying with ASTM A 666.
 - 3. Include automatic drop baffle to guard against passage of smoke or flame on Fire Rated units.
 - 4. Shape: Square.

- B. Smoke Seals: Provide UL-listed and -tested smoke-seal perimeter gaskets.
- C. Weatherseals: Provide replaceable, adjustable, continuous, compressible weather-stripping gaskets fitted to bottom and top of exterior doors, unless otherwise indicated. At door head, use 1/8-inch- thick, replaceable, continuous sheet secured to inside of hood.
 - 1. Provide motor-operated doors with combination bottom weatherseal and sensor edge.
 - 2. In addition, provide replaceable, adjustable, continuous, flexible, 1/8-inch- thick seals of flexible vinyl, rubber, or neoprene at door jambs for a weathertight installation.
- D. Vision Windows: Provide 1/4-inch- thick, clear transparent acrylic sheet windows. Set glazing in vinyl, rubber, or neoprene glazing channel secured to curtain slats.
- E. Push/Pull Handles: For manual push-up-operated or emergency-operated doors, provide galvanized steel lifting handles on each side of door. Provide pull-down straps or pole hooks for doors more than 84 inches high.
- F. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.
- G. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
 - 1. Locking Bars: Full-disc cremone type, both jamb sides operable from inside and outside.
 - 2. Lock cylinder is specified in Division 08 Section "Door Hardware."
- H. Chain Lock Keeper: Suitable for padlock.
- I. If door unit is power operated, provide safety interlock switch to disengage power supply when door is locked.
- J. Provide automatic-closing device, with [oscillating] [viscous-speed] governor unit complying with requirements of NFPA 80 and with an easily tested and reset release mechanism, and designed to be activated by the following:
 - 1. Manufacturer's standard UL-labeled smoke detector and door-holder-release devices
 - 2. Manufacturer's standard UL-labeled heat detector and door-holder-release devices
 - 3. Building fire alarm and detection system and door-holder-release devices

2.5 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to door curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

- C. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.
- D. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast iron or cold-rolled steel plate.

2.6 MANUAL DOOR OPERATORS

- A. Push-up Operation: Design counterbalance mechanism so required lifts or pulls for door operation does not exceed 25 lbf.
- B. Chain-Hoist Operator: Provide manual chain-hoist operator consisting of endless steel hand chain, chain pocket wheel and guard, and gear-reduction unit with a maximum 35-lbf force for door operation. Provide alloy steel hand chain with chain holder secured to operator guide.
 - 1. Provide through-wall shaft operator.
- C. Crank-Hoist Operator: Provide crank-hoist operator consisting of crank and crank gearbox, steel crank drive shaft, and gear-reduction unit. Size gears to require no more than 35-lbf force to turn crank. Fabricate gearbox to be oil tight and completely enclose operating mechanism. Provide manufacturer's standard crank-locking device.
 - 1. Provide manufacturer's standard removable operating arm for each crank-gear unit.
 - 2. Provide through-wall shaft operator.

2.7 ELECTRIC DOOR OPERATORS

- A. General: Provide electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycle requirements specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
- B. Comply with NFPA 70.
- C. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging chain and sprocket operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- D. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.

- E. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, ac or dc.
- F. Door-Operator Type: Provide wall-, hood-, or bracket-mounted, jackshaft-type door operator unit consisting of electric motor, worm-gear running-in-oil drive, and chain and sprocket secondary drive.
 - 1. Through-wall-mounted motor operator.
- G. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motors complying with NEMA MG 1; with overload protection; sized to start, accelerate, and operate door in either direction from any position, at not less than 2/3 fps and not more than 1 fps, without exceeding nameplate ratings or service factor.
 - 1. Type: Polyphase, medium-induction type
 - 2. Service Factor: According to NEMA MG 1, unless otherwise indicated
 - 3. Coordinate wiring requirements and electrical characteristics of motors with building electrical system
 - 4. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.
 - 5. Provide totally enclosed, nonventilated or fan-cooled motor, fitted with plugged drain, and controller with NEMA ICS 6, Type 4 enclosure where indicated.
- H. Control Station: Provide "ON/OFF" keyswitch and momentary-contact, three-button control station with push-button controls labeled "Open," "Close," and "Stop." Cylinder for keyswitch by Division 8 "Finish Hardware".
 - 1. Provide interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
 - 2. Provide exterior units, full-guarded, standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosure, key operated.
- I. Obstruction Detection Device: Provide each motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of sensor immediately stops and reverses downward door travel.
 - 1. Sensor Edge: Provide each motorized door with an automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward door travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Provide [pneumatically] [electrically] actuated automatic bottom bar.
 - b. Self-Monitoring Type: Four-wire configured device. Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.
- J. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- K. Provide electric operators with ADA-compliant audible alarm and visual indicator lights.

L. Radio Control: Provide radio control system consisting of the following:

1. Three-channel universal coaxial receiver to open, close, and stop door, one per operator
2. Multifunction remote control
3. Remote antenna mounting kit

2.8 FINISHES, GENERAL

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 STEEL AND GALVANIZED STEEL FINISHES

- A. Factory Primer for Field Finish: Manufacturer's standard primer, compatible with field-applied finish according to coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
1. Apply to ferrous surfaces except zinc-coated metal.
- B. Baked Finish: Manufacturer's standard baked finish consisting of primer and topcoat according to coating manufacturer's written instructions for cleaning, pretreatment, application, thermosetting, and minimum dry film thickness.
- C. Powder-Coat Finish: Manufacturer's standard powder-coat finish consisting of primer and topcoat according to coating manufacturer's written instructions for cleaning, pretreatment, application, thermosetting, and minimum dry film thickness.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.10 STAINLESS-STEEL FINISHES

- A. General: Remove or blend stretch lines and tool and die marks into finish.
1. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. Bright, Directional Polish: No. 4 finish
- C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install coiling doors and operating equipment complete with necessary hardware, jamb and head molding strips, anchors, inserts, hangers, and equipment supports.
 - 1. Install fire-rated doors to comply with NFPA 80

3.2 ADJUSTING

- A. Lubricate bearings and sliding parts; adjust doors to operate easily, free of warp, twist, or distortion and with weathertight fit around entire perimeter.

3.3 STARTUP SERVICES

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - a. Test door closing when activated by detector or alarm-connected fire-release system. Reset door-closing mechanism after successful test.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 08 33 23

SECTION 08 90 00 - LOUVERS AND VENTS

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. Fixed, extruded-aluminum drainable louvers
 - 2. Fixed, formed-metal acoustical louvers
 - 3. Wall vents (brick vents)

- B. Related Sections:

- 1. Division 04 Section "Unit Masonry" for building wall vents (brick vents) into masonry
 - 2. Division 07 Section "Exterior Insulation and Finish System (EIFS)" for louvers wall systems
 - 3. Division 07 Section "Metal Wall Panels" for louvers wall systems
 - 4. Division 08 Section "Flush Wood Doors" for louvers in flush wood doors
 - 5. Division 23 Sections for louvers that are interfaced with mechanical equipment
 - 6. Division 23 Section "Instrumentation and Control for HVAC" for electric, electronic, and pneumatic control of adjustable louvers
 - 7. Division 26 Sections for electrical power connections for motor-operated adjustable louvers

1.3 REFERENCES

- A. AAMA 2605 - Specification for Superior High Performance Organic Coatings on Architectural Extrusions and Panels
- B. AAMA 610.1 - Guide Specification for Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels
- C. AMCA Standard 500 - Louver Air Flow Certification
- D. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
- E. ASTM D 412 - Test Method for Vulcanized Rubbers and Thermoplastic Elastomers - Tension
- F. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates

1.4 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
- C. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.
- B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawing SG.3.
- C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to SEI/ASCE 7. Refer to Drawing SG.3 for additional information.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstressing of components, failure of connections, or other detrimental effects.
 - 1. Temperature Change (Range): 120 deg F, ambient material surfaces.
- E. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- F. Acoustic Performance: Provide acoustical louvers complying with ratings specified, as demonstrated by testing manufacturer's stock units identical to those specified, except for length and width for airborne sound-transmission loss according to ASTM E 90.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
 - 3. Wiring Diagrams: For power, signal, and control wiring for motorized adjustable louvers.
- C. Samples: For each type of metal finish required.
- D. Delegated-Design Submittal: For louvers indicated to comply with structural and seismic performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum"
 - 2. AWS D1.6, "Structural Welding Code - Stainless Steel"
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.
- D. UL and NEMA Compliance: Provide motors and related components for motor-operated louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B 26/B 26M, Alloy 319.
- D. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. Use tamper-resistant 300 series stainless-steel fasteners.
 - 2. For color-finished louvers, use fasteners with heads that match color of louvers.
- E. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
 - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern where indicated.
 - 2. Horizontal Mullions: Provide horizontal mullions at joints where indicated.
- C. Maintain equal louver blade spacing to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
 - 1. Frame Type: Exterior flange with continuous angle and frame extension as shown on drawings unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.

- F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
1. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
 2. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.
 3. Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
- G. Provide subsills made of same material as louvers for recessed louvers.
- H. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal Storm-Resistant Louver

1. Basis-of-Design: : Airolite Company
 - a. Exposed Mullion Drainable Blade: Type K6776
 - b. Continuous Drainable Blade: Type CB6776
 - c. Low Velocity Louver: Type K6386
2. Alternate Acceptable Manufacturers Subject to compliance with requirements:

| | Exp. Mull Drainable <u>Blade</u> | Cont. Drainable <u>Blade</u> | Low <u>Velocity</u> |
|--------------------------------|--|------------------------------------|------------------------|
| Airline Products Co. | LSA4D38,1b | | 1c LSX4W45 |
| Construction Specialties, Inc. | A-4097 | C-4097 | A4100 |
| Ruskin Mfg. Co. | ELF375DX | CELF375DX | ELF6811 |

3. Louver Depth: 6 inches
4. Frame and Blade Nominal Thickness: Not less than 0.080 inch for blades and 0.080 inch for frames.
5. Louver Performance Ratings:
 - a. Free Area: Not less than 8.0 sq. ft. for 48-inch- wide by 48-inch- high louver.
 - b. Air Performance: Not more than 0.10-inch wg static pressure drop at 700-fpm free-area velocity.
 - c. Water Penetration Performance: Free area velocity at beginning point of water penetration at .01 Oz water per square foot of free area shall not be less than 1000fpm.

6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 FIXED, ACOUSTICAL LOUVERS

- A. Louver with formed-metal blades filled on interior with mineral-fiber, acoustical insulation retained by perforated metal sheet of same material and finish as blade.
 1. Basis-of-Design: Airolite Company. Model no.T9212.
 2. Alternate Acceptable Manufacturers Subject to compliance with requirements, provide comparable product by one of the following:
 - a. Construction Specialties, Inc. A12970
 - b. Ruskin Company; Tomkins PLC.ACL1245AF
 3. Louver Depth: 12 inches
 4. Frame Material: Extruded-aluminum or aluminum sheet, not less than 0.080-inch nominal thickness.
 5. Blade Material: Aluminum sheet, not less than 0.080-inch nominal thickness.
 6. Blade Shape: Airfoil.
 7. Blade Angle: 45 degrees unless otherwise indicated.
 8. Louver Performance Ratings:
 - a. Free Area: Not less than 3.5 sq. ft. for 48-inch- wide by 48-inch- high louver.
 - b. Air Performance: Not more than 0.10-inch wg static pressure drop at 700-fpm free-area velocity.
 - c. Water Penetration Performance: Free area velocity at beginning point of water penetration at .01 Oz water per square foot of free area shall not be less than 1000fpm.
 9. Airborne Sound-Transmission Loss:

| Frequency Hz | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|----|-----|-----|-----|------|------|------|------|
| Noise Reduction | 13 | 10 | 13 | 15 | 16 | 16 | 17 | 20 |

2.5 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 1. Screen Location for Fixed Louvers: Interior face
 2. Screening Type: Bird screening
- B. Secure screen frames to louver frames with stainless-steel machine screws spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 1. Reinforced extruded-aluminum screen frames with corner clips
 2. Finish: Mill finish unless otherwise indicated

D. Louver Screening:

1. Bird Screening: Aluminum, 1/2-inch- square mesh, 0.063-inch wire

2.6 BLANK-OFF PANELS

A. Uninsulated, Blank-Off Panels: Metal sheet attached to back of louver.

1. Galvanized-steel sheet, not less than 20G 0.035-inch nominal thickness
2. Attach blank-off panels with sheet metal screws

B. Insulated, Blank-Off Panels: Laminated panels consisting of insulating core surfaced on back and front with metal sheets and attached to back of louver.

1. Thickness: 2 inches
2. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch nominal thickness
3. Metal Facing Sheets: Galvanized-steel sheet, not less than 0.028-inch nominal thickness
4. Insulating Core: Rigid, glass-fiber-board insulation or extruded-polystyrene foam
5. Edge Treatment: Trim perimeter edges of blank-off panels with extruded-aluminum-channel frames, as shown on drawings, with corners mitered and with same finish as panels
6. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
7. Panel Finish: To match louver finish.
8. Attach blank-off panels with sheet metal screws.

2.7 WALL VENTS (BRICK VENTS)

A. Cast-Aluminum Wall Vents:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Airolite Company, LLC (The)
 - b. Construction Specialties, Inc.
 - c. Hohmann & Barnard, Inc.
2. One-piece, cast-aluminum louvers and frames; with 18-by-14- mesh, aluminum insect screening on inside face; incorporating integral waterstop on inside edge of sill; of load-bearing design and construction.
3. Dampers: Aluminum blades and frames mounted on inside of wall vents; operated from exterior with Allen wrench in socket-head cap screw. Fabricate operating mechanism from Type 304 stainless-steel components.
4. Finish: Mill finish.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.9 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. High-Performance Organic Finish: 2-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: Match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect unpainted galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 90 00

SECTION 09 91 13 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete - existing
2. Steel
3. Galvanized metal
4. Aluminum (not anodized or otherwise coated)
5. Wood
6. Plastic trim fabrications
7. Exterior gypsum board

- B. Related Sections include the following:

1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
2. Division 06 Sections for shop priming carpentry with primers specified in this Section.
3. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
4. Division 09 painting Sections for special-use coatings.
5. Division 09 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

1.3 REFERENCES

- A. Green Seal Standard.
- B. UL - Underwriters' Laboratories.
- C. ANSI A13.1 - Scheme for the Identification of Piping Systems.
- D. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
- E. SSPC, The Society for Protective Coatings (SSPC) - Published Standards.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square
 - 2. Step coats on Samples to show each coat required for system
 - 3. Label each coat of each Sample
 - 4. Label each Sample for location and application area
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.5 QUALITY ASSURANCE

- A. MPI Standards:
 - 1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required
 - 2. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Acceptance at Site
 - 1. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation, VOC content and instructions for mixing and/or reducing.

2. A qualified representative of paint manufacturer shall verify at site and report to Architect's representative that paint delivered is in accordance with specifications; he shall provide proper application procedures for unusual finishes, and shall assist in providing samples for use as criteria for finish work.

B. Storage and Protection

1. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45° F. in well ventilated area.
2. Take precautionary measures to prevent fire hazards and spontaneous combustion.
3. Adequately protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.
4. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
5. Place cotton waste, cloths and material which may constitute a fire hazard in closed metal containers and remove daily from site.
6. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned and replaced on completion of work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

1.7 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.8 GUARANTEE/WARRANTY

- A. Provide a one year written warranty from paint manufacturer covering defects in material. Areas with defective material shall be repaired as required to make the repair indiscernible.
- B. For MAB Modac or acceptable equivalent, the paint manufacturer shall provide a ten year written material warranty and a five year written labor warranty against defects in material/workmanship.

1.9 EXTRA MATERIALS

- A. Furnish not less than 2 gallons of each type of coating and color that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1.10 PROJECT/SITE CONDITIONS

A. Environmental Conditions

1. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture contents of surfaces are below following maximums:
 - a. Plaster and Gypsum Wallboard: 12%
 - b. Masonry, Concrete and Concrete Block: 12%
 - c. Exterior Wood: 12%
2. Ensure surface temperatures and the surrounding air temperature is above 40° F before applying finishes. Minimum application temperatures for latex paints for interior work is 45° F and 50° F for exterior work.
3. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45° F for 24 hours before, during and 48 hours after application of finishes.
4. Provide minimum 25 foot candles of lighting on surfaces to be finished.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Only the first line premium quality trade sales and high performance (HiPac) products of the following manufacturers will be considered for Architect's approval. Subject to conforming to material Specification herein.

1. Basis of Design
 - a. M. A. Bruder & Sons Company (MAB)
2. Other Acceptable Manufacturers subject to compliance with requirements
 - a. Benjamin Moore Regal, MoorLife, MoorGuard and MoorGlo
 - b. Sherwin-Williams Company Super Paint

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As indicated in a color schedule.

C. Block Filler

1. Apply to completely fill all voids
2. Squeegee apply for a pinhole free application
3. Apply in 1 or 2 coats for a total coverage of approximately
 - a. 200 sq. ft. per gallon - Ply Mastic
 - b. 50-75 sq. ft. per gallon - Block Kote #2000
4. Obtain Architect's approval of appearance before proceeding with finish coats.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to Architect, any condition that may potentially affect proper application. Do not commence until such defects have been corrected.
- B. Correct defects and deficiencies in surfaces which may adversely affect work of this section.
- C. Painting of surface shall constitute acceptance; Contractor shall thereafter be responsible for any paint failure.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- C. All surfaces are to be clean and dry, free of all dirt, dust, grease and contaminants.
- D. Remove mildew, by scrubbing with solution of bleach and water. Rinse with clean water and allow surface to dry completely.
- E. Remove surface contamination from aluminum surfaces requiring a paint finish by steam, high pressure water or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.
- F. Remove dirt, oil, grease and sand if necessary to provide adhesion key, when asphalt or bituminous surfaces require a paint finish. Apply compatible sealer or primer.
- G. Remove dirt, grease and oil from canvas and cotton insulated coverings.

- H. Remove contamination, acid etch and rinse new concrete floors with clear water. Ensure required acid-alkali balance is achieved. Allow to thoroughly dry.
- I. Remove contamination from copper surfaces requiring paint finish by steam, high pressure water or solvent washing. Apply vinyl etch primer or acid etch. Apply paint immediately if acid etching.
- J. Remove contamination from copper surfaces required to be oxidized. Apply oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for correct effect. Once attained, rinse surfaces well with clear water and allow to dry.
- K. Remove contamination from gypsum wallboard surfaces and prime to show defects, if any. Paint after defects have been remedied.
- L. Remove surface contamination and oils from galvanized surfaces and wash with solvent (SSPC-SP1). Surfaces shall receive an acid etch (MAB Galvaprep) washed off with water and allowed to dry.
- M. Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.
- N. Remove dirt, loose mortar, scale, powder and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive a clear seal. Remove oil and grease with a solution of trisodium phosphate, rinse well and allow to thoroughly dry.
- O. Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.
- P. Fill hairline cracks, small holes and imperfections on drywall surfaces. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.
- Q. Remove grease, rust, scale, dirt and dust from steel and iron surfaces. Where heavy coatings of scale are evident, remove by wire brushing, (SSPC-SP2) or any other necessary method. Ensure steel surfaces are satisfactory before paint finishing.
- R. Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.
- S. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touchup patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces except where scheduled to receive spray fireproofing.
- T. Wipe off dust and grit from miscellaneous wood items and millwork prior to priming. Spot coat knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand between coats. Back prime interior and exterior woodwork.
- U. Remove dust, grit and foreign matter from exterior wood siding which is to receive paint finish. Seal knots, pitch streak and sappy sections. Fill nail holes with exterior caulking compound after prime coat has been applied.

- V. Prior to finishing glue laminated beams, wash down surfaces with solvent and remove grease and dirt.
- W. Existing painted surfaces shall be sanded and/or cleaned, as specified above for particular surfaces, before application of new paint.

3.3 APPLICATION

- A. Apply each coat at proper consistency and specified mil thickness.
- B. Each coat of paint is to be slightly darker than preceding coat unless otherwise approved by Architect.
- C. Sand lightly between coats to achieve required finish.
- D. Do not apply finishes on surfaces that are not sufficiently dry.
- E. Allow each coat of finish to cure or dry before following coat is applied. Follow manufacturer's instructions for recoat time.
- F. Where clear finishes are required ensure tint fillers match wood. Work fillers well into the grain before set. Wipe excess from the surface.
- G. Backprime exterior woodwork, which is to receive paint finish, with exterior primer paint.
- H. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoater paint.
- I. Backprime interior and exterior woodwork, which is to receive stain and/or clear finish, with gloss varnish reduced 25% with mineral spirits.
- J. Prime top and bottom edges of wood and metal doors with enamel undercoat when they are to be painted.
- K. Prime top and bottom edges of wood doors with gloss varnish when they are to receive a stain or clear finish.
- L. In painting of operating units, no paint shall be applied to sliding contacts and the like where bare material is necessary for proper operation. Paint applied to such surfaces shall be removed.
- M. Before leaving shop or mill, millwork shall be primed and/or sealed.
 - 1. Unexposed surfaces of millwork shall be given one (1) coat of an approved wood primer.
 - 2. Exterior woodwork shall receive at the mill one dipped coat of paintable "Woodlife" or other approved wood preservative where specified, in addition to primer or sealer.
 - 3. Exposed surfaces of natural or stained finishes shall be stained, filled and/or sealed as required.
- N. Touch up any finish work requiring same after other trades are finished.

- O. Apply block filler in accordance with manufacturer's instructions. Fill all voids leaving no pinholes.
- P. It shall be distinctly understood that merely going over surfaces specified number of times, even with materials of required purity and strength, will not assure acceptance; body finish desired also involves proper application of contract materials. This result cannot be obtained by thinning good materials, using poor materials, or by adulteration. Attention is particularly drawn to requirements concerning preparation of surfaces. Acceptance of work at final inspection will be governed by body finish of materials presented at that time.
- Q. Finished work shall be uniform, of approved color, smooth and free from runs, sags, defective brushing and clogging. Edges of paint adjoining other materials or colors, shall be sharp and clean without overlapping. Apply materials in strict conformity with manufacturer's directions.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of paint materials with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Wood Items: (Fences, siding, joists, plywood, partitions, underside decking, etc. - other than trim)
- a. Paint Finish - Flat: Acrylic Latex emulsion primer not less than 32% vol. solids with 2 finish coats of 100% acrylic flat finish with not less than 40% vol. solids. Total minimum DFT 4.1 mils 1 coat primer Sea Shore Exterior Latex Primer - minimum 1.3 mils DFT
 - b. 2 coats finish Sea Shore Acrylic Latex House Paint - minimum 1.4 mils DFT per coat
 - c. Paint Finish - Satin: Acrylic Latex emulsion primer not less than 32% vol. solids with 2 finish coats of 100% acrylic enamel satin finish with not less than 36% vol. solids. Total minimum DFT 3.9 mils 1 coat primer Sea Shore Exterior Latex Primer - minimum 1.3 mils DFT
 - d. 2 coats finish Sea Shore Satin Acrylic Latex House Paint - minimum 1.3 mils DFT per coat
2. Stain Finish: Penetrating alkyd stain
- a. 2 coats stain MAB/Cabot Semi-Transparent TimberStain
3. Wood Trim (Doors, door frame, window sash and frames, fascia, batten, etc.)
- a. Paint Finish - Semi-Gloss: Acrylic Latex emulsion primer not less than 32% vol. solids with 2 finish coats of 100% acrylic enamel semigloss finish with not less than 41% vol. solids. Total minimum DFT 3.7 mils 1 coat primer Sea Shore Exterior Latex Primer - minimum 1.3 mils DFT
 - b. 2 coats finish Sea Shore Acrylic Latex Trim Enamel - minimum 2.0 mils DFT per coat
4. Stain Finish - Penetrating alkyd stain
- a. 2 coats stain MAB/Cabot Semi-Transparent TimberStain
- B. Concrete (Existing)
- 1. Paint Finish - Satin: Solvent acrylic coating system. 1 coat of acrylic block filler not less than 43% vol. solids with 1 coat of solvent acrylic type waterproofing sealer with not less than 43% vol. solids. Perm rating not less than 8.3 perms according to TT-C-555B. Application temperatures as low as 20° F.
 - a. 2 coats MODAC - Modac F -8 mils DFT per coat.
- C. Metal Fabrication: (Including, but not limited to iron and steel, control panels, handrails, ornamental iron, lintels, fences, fire escapes, pipes, catwalks, posts, rails, sash, frames and trim, equipment, machinery) and
- Structural Steel: (Structural columns and beams, poles - factory primed)

1. Paint Finish - Gloss: Rust inhibitive alkyd primer free of lead and chromates not less than 43% vol. with 2 finish coats of silicone alkyd gloss finish with not less than 47% vol. solids and not less than 30% silicone. Total minimum DFT 5.4 mils (with primer)
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.8 mils DFT
 - b. 2 coats finish Rust-O-Lastic Alkyd finish - minimum 1.8 mils DFT per coat
Spot prime/touch-up shop prime coat
- D. Galvanized Metal: (Downspouts, eavestroughs, flashing, doors and frames, roof and wall sheets, handrails, lintels, posts)
 1. Paint Finish - Gloss: 100% acrylic rust inhibitive primer with not less than 36% vol. solids with 2 finish coats silicone alkyd gloss enamel finish with not less than 47% vol. solids and not less than 30% silicone. Total minimum DFT 5.1 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic Silicone Alkyd Finish - minimum 1.8 mils DFT per coat
- E. Ferrous Metal: Rooftop equipment, structure, supports, etc.
 1. Paint Finish - Gloss: High performance polyamine epoxy mastic primer semigloss not less than 90% vol. solids with 2 finish coats of high performance high solids aliphatic acrylic urethane not less than 66% vol. solids. Total minimum DFT 9.0 mils
 - a. 1 coat primer MAB Ply-Mastic - 5.0 -7.0 mils DFT
 - b. 2 coats finish MAB Ply-Thane 890 HS - minimum 2.0 -2.6 mils DFT per coat
- F. Galvanized and Nonferrous Metal: Rooftop equipment, structure, supports, etc.
 - a. Paint Finish - Gloss: Polyamide epoxy primer not less than 50% vol. solids with 2 finish coats of high performance high solids aliphatic acrylic urethane not less than 66% vol. solids. Total minimum DFT 6.3 mils 1 coat primer MAB Epoxy Primer - minimum 2.0 -6.0 mils DFT
 - b. 2 coats finish MAB Ply-Thane 890 HS - minimum 2.0 -6.0 mils DFT per coat
- G. Aluminum: (flashings, miscellaneous work, handrails, posts, downpipes)
 1. Paint Finish - Gloss: 100% acrylic rust inhibitive primer with not less than 36% vol. solids with 2 finish coats of alkyd gloss enamel finish with not less than 54% vol. solids. Total minimum DFT 5.1 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic Alkyd Finish - minimum 1.8 mils DFT per coat

H. Exterior Galvanized Piping: (Neutralized before paint is applied)

1. Paint Finish - Gloss: 100% acrylic rust inhibitive primer with not less than 36% vol. solids with 2 finish coats of alkyd gloss enamel finish with not less than 54% vol. solids. Total minimum DFT 5.1 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic Alkyd Finish - minimum 1.8 mils DFT per coat

END OF SECTION 09 91 13

SECTION 09 91 23 - INTERIOR PAINTING

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 project is a LEED project. Section 01 81 13 - Sustainable Design Requirements must be referenced.
- B. Priming and backpainting of woodwork, except as noted in Division 6 Sections of Specifications.
- C. Finished spaces including telephone and electrical closets. Finished spaces are all spaces or rooms throughout building, except spaces above suspended ceilings unless otherwise specified or noted.
- D. Exposed structural steel, steel joists and miscellaneous iron, including exposed steel supports of metal siding, screens, dunnage and supports for equipment on roof, except shop priming.
- E. Exposed interior steel and metal work (except shop priming) including, but not necessarily limited to, the following:
 - 1. Exposed metal roof decking
 - 2. Exposed steel stairwork
 - 3. Steel hand railings and supports
 - 4. Interior metal doors and frames
 - 5. Bumper guards and angle at loading docks
 - 6. Steel channel jambs
 - 7. Drapery or blind pockets
 - 8. Steel bollards
 - 9. Wiremesh partitions
 - 10. Catwalks
 - 11. Ladders
- F. Exposed metal without a finish coat.
- G. Interior exposed concrete walls, floors and equipment pads.
- H. Interior concrete masonry not scheduled to receive wall covering, unless specifically otherwise noted or specified.
- I. Drywall or veneer plaster or plaster not scheduled to receive wall covering.
- J. Woodwork (unless included in Division 6).

- K. All interior exposed wood surfaces of windows, including stools, aprons, surrounds, trim.
- L. Surfaces and equipment above suspended ceilings only where this space is being used as a supply air plenum.
- M. Reveals where noted and indicated on the Drawings.
- N. Finishing of primed and touching up of painted factory items and equipment unless specifically mentioned otherwise in schedule.
- O. Inside surfaces (black) of ducts behind louvers, grilles, etc., and walls (black) visible through grilles.
- P. Painting of work furnished and installed under "DIVISION 23 - HVAC" (unless specifically included under any Section of DIVISION 23 and except those items having factory finish).
- Q. Painting of work furnished and installed under "DIVISION 26 - ELECTRICAL" (unless specifically included under any Section of DIVISION 26, and except those items having factory finish).
 - 1. Panelboards or box fronts (including those with factory finish) shall be field painted to match adjacent wall finishes.
- R. Do NOT paint or in any way obscure certification or identification labels on any material or equipment.
- S. For products applied on site - Paints, coatings and primers applied to interior walls and ceilings shall not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates shall not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC003, Anti-Corrosive Paints, Second Addition, January 7, 1997. Clear wood finishes, floor coatings, stains, sealers and shellacs applied to interior elements shall not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
- T. Related Sections include the following:
 - 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements.
 - 2. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
 - 3. Division 06 Sections for shop priming carpentry with primers specified in this Section.
 - 4. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
 - 5. Division 09 Section "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
 - 6. Division 09 Section "Gypsum Board Systems"

1.3 REFERENCES

- A. SCAQMD - South Coast Air Quality Management District
- B. UL - Underwriters' Laboratories
- C. ANSI A13.1 - Scheme for the Identification of Piping Systems
- D. ASTM C 1028 - Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like surfaces by the Horizontal Dynamometer Pull Meter Method
- E. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials
- F. SSPC, The Society for Protective Coatings (SSPC) - Published Standards
- G. Green Seal Standard

1.4 SUBMITTALS

- A. LEED Submittals
 - 1. For Credit EQ 4.2, manufacturers' product data for paints, including printed statement of VOC content and chemical components.
- B. Product Data: For each type of product indicated.
 - 1. With product data for each floor finish material specified, manufacturer shall provide slip resistance data from tests performed by an independent testing agency in accordance with ASTM C 1028 for coefficient of friction.
- C. Samples for Initial Selection: For each type of topcoat product indicated.
- D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square
 - 2. Step coats on Samples to show each coat required for system
 - 3. Label each coat of each Sample
 - 4. Label each Sample for location and application area
- E. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Finish Schedule.
- F. Samples
 - 1. Prepare 12 inch x 12 inch Samples of all finishes. When possible, apply finishes on identical type materials to which they will be applied on project.

2. Identify each Sample as to finish, formula, color name, color number, sheen name and gloss units.
3. Colors are noted on the Finish Schedule.

G. Certifications

1. Before starting work, surfaces scheduled to be painted shall be inspected and tested by paint manufacturer's representative and certified that surfaces are compatible and in satisfactory condition to receive finish specified.
2. Manufacturer shall certify that all products are VOC compliant (in accord with Article 1.03) for the specific project. Advise Architect of any coating materials specified that are not in compliance with VOC regulations and provide equivalent materials that are in compliance at no additional cost to the Owner.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
 3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site

1. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation, VOC content and instructions for mixing and/or reducing.

B. Storage and Protection

Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45° F in well ventilated area.

1. Take precautionary measures to prevent fire hazards and spontaneous combustion.
2. Adequately protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.

3. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
4. Place cotton waste, cloths and material which may constitute a fire hazard in closed metal containers and remove daily from site.
5. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned and replaced on completion of work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

1.7 GUARANTEE/WARRANTY

- A. Provide a one year written warranty from paint manufacturer covering defects in material. Areas with defective material shall be repaired as required to make the repair indiscernible.

1.8 EXTRA MATERIALS

- A. Furnish not less than 2 gallons of each type of coating and color that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1.9 PROJECT/SITE CONDITIONS

A. Environmental Conditions

1. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture contents of surfaces are below following maximums:
 - a. Plaster and Gypsum Wallboard: 12%
 - b. Masonry, Concrete and Concrete Block: 12%
 - c. Interior Wood: 12%
 - d. Exterior Wood: 12%
 - e. Concrete Floors: 12%
2. Ensure surface temperatures and the surrounding air temperature is above 40° F before applying finishes. Minimum application temperatures for latex paints for interior work are 45° F and 50° F for exterior work.
3. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45° F for 24 hours before, during and 48 hours after application of finishes.
4. Provide minimum 25 foot candles of lighting on surfaces to be finished.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Only the first line premium quality trade sales and high performance (HiPac) products of the following manufacturers will be considered for Architect's approval. Subject to conforming to material Specification herein.
 - 1. Basis of Design
 - a. M. A. Bruder & Sons Company (MAB)
 - 2. Other Acceptable Manufacturers subject to compliance with requirements
 - a. Benjamin Moore Regal, MoorLife, MoorGuard and MoorGlo
 - b. Sherwin-Williams Company Super Paint
 - 3. Basis of Design (interior multicolor coating only): Zolatone
 - 4. Other Acceptable Manufacturer subject to compliance with requirements (interior multicolor coating only): Polomyx

2.2 PAINT, GENERAL

- A. Material shall meet Class A fire rating when applied on noncombustible substrates.
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:
 - 1. Flat Paints and Coatings:
 - a. Off white and pastel colors: VOC content of not more than 50 g/L.
 - b. Medium and dark value colors: VOC content not more than 100 g/L
 - 2. Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
 - 3. 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).
 - 4. Restricted Components: Paints and coatings shall not contain any of the following:

- a. Acrolein
- b. Acrylonitrile
- c. Antimony
- d. Benzene
- e. Butyl benzyl phthalate
- f. Cadmium
- g. Di (2-ethylhexyl) phthalate
- h. Di-n-butyl phthalate
- i. Di-n-octyl phthalate
- j. 1,2-dichlorobenzene
- k. Diethyl phthalate
- l. Dimethyl phthalate
- m. Ethylbenzene
- n. Formaldehyde
- o. Hexavalent chromium
- p. Isophorone
- q. Lead
- r. Mercury
- s. Methyl ethyl ketone
- t. Methyl isobutyl ketone
- u. Methylene chloride
- v. Naphthalene
- w. Toluene (methylbenzene)
- x. 1,1,1-trichloroethane
- y. Vinyl chloride

D. Colors: As selected by Architect from manufacturer's full range or match Architect's samples as indicated in a finish schedule.

E. Block Filler

- 1. Apply to completely fill all voids
- 2. Squeegee apply for a pinhole free application
- 3. Apply in 1 or 2 coats for a total coverage of approximately
 - a. 200 sq. ft. per gallon - Ply Mastic
 - b. 50-75 sq. ft. per gallon - Block Kote #2000
- 4. Obtain Architect's approval of appearance before proceeding with finish coats.

F. Zero VOC (less than 5 grams/liter) Type Finishes: [LEED compliant] Enviro-Pure systems as manufactured by MAB are the standard and basis of design. Specular gloss readings in accordance with ASTM D 523 (measured at 60°). Flat - less than 3; Eggshell - 7 \pm 3; Semi-Gloss - 40 \pm 3.

2.3 ADA COMPLIANCE

A. All flooring in wet condition shall be in accordance with ADA recommendation for slip resistance, COF of .6 for level and .8 for ramped surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to Architect, any condition that may potentially affect proper application. Do not commence until such defects have been corrected.
- B. Correct defects and deficiencies in surfaces which may adversely affect work of this section.
- C. Painting of surface shall constitute acceptance; Contractor shall thereafter be responsible for any paint failure.

3.2 PREPARATION

- A. All surfaces are to be clean and dry, free of all dirt, dust, grease and contaminants.
- B. Remove mildew, by scrubbing with solution of bleach and water. Rinse with clean water and allow surface to dry completely.
- C. Remove surface contamination from aluminum surfaces requiring a paint finish by steam, high pressure water or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.
- D. Remove dirt, oil, grease and sand if necessary to provide adhesion key, when asphalt or bituminous surfaces require a paint finish. Apply compatible sealer or primer.
- E. Remove dirt, grease and oil from canvas and cotton insulated coverings.
- F. Remove contamination, acid etch and rinse new concrete floors with clear water. Ensure required acid-alkali balance is achieved. Allow to thoroughly dry.
- G. Remove contamination from copper surfaces requiring paint finish by steam, high pressure water or solvent washing. Apply vinyl etch primer or acid etch. Apply paint immediately if acid etching.
- H. Remove contamination from copper surfaces required to be oxidized. Apply oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for correct effect. Once attained, rinse surfaces well with clear water and allow to dry.
- I. Remove contamination from gypsum wallboard surfaces and prime to show defects, if any. Paint after defects have been remedied.
- J. Remove surface contamination and oils from galvanized surfaces and wash with solvent (SSPC-SP1). Surfaces shall receive an acid etch (MAB Galvaprep) washed off with water and allowed to dry.
- K. Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.

- L. Remove dirt, loose mortar, scale, powder and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive a clear seal. Remove oil and grease with a solution of trisodium phosphate, rinse well and allow to thoroughly dry.
- M. Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.
- N. Fill hairline cracks, small holes and imperfections on drywall surfaces. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.
- O. Remove grease, rust, scale, dirt and dust from steel and iron surfaces. Where heavy coatings of scale are evident, remove by wire brushing, (SSPC-SP2) or any other necessary method. Ensure steel surfaces are satisfactory before paint finishing.
- P. Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.
- Q. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touchup patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces except where scheduled to receive spray fireproofing.
- R. Wipe off dust and grit from miscellaneous wood items and millwork prior to priming. Spot coat knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand between coats. Back prime interior and exterior woodwork.
- S. Remove dust, grit and foreign matter from exterior wood siding which is to receive paint finish. Seal knots, pitch streak and sappy sections. Fill nail holes with exterior caulking compound after prime coat has been applied.
- T. Prior to finishing glue laminated beams, wash down surfaces with solvent and remove grease and dirt.
- U. Existing painted surfaces shall be sanded and/or cleaned, as specified above for particular surfaces, before application of new paint.
- V. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

3.3 APPLICATION

- A. Apply each coat at proper consistency and specified mil thickness.
- B. Each coat of paint is to be slightly darker than preceding coat unless otherwise approved by Architect.
- C. Sand lightly between coats to achieve required finish.

- D. Do not apply finishes on surfaces that are not sufficiently dry.
- E. Allow each coat of finish to cure or dry before following coat is applied. Follow manufacturer's instructions for recoat time.
- F. Where clear finishes are required ensure tint fillers match wood. Work fillers well into the grain before set. Wipe excess from the surface.
- G. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoater paint.
- H. Backprime interior woodwork, which is to receive stain and/or clear finish, with gloss varnish reduced 25% with mineral spirits.
- I. Prime top and bottom edges of wood and metal doors with enamel undercoat when they are to be painted.
- J. Prime top and bottom edges of wood doors with gloss varnish when they are to receive a stain or clear finish.
- K. In painting of operating units, no paint shall be applied to sliding contacts and the like where bare material is necessary for proper operation. Paint applied to such surfaces shall be removed.
- L. Before leaving shop or mill, millwork shall be primed and/or sealed.
 - 1. Unexposed surfaces of millwork shall be given one (1) coat of an approved wood primer.
 - 2. Exposed surfaces of natural or stained finishes shall be stained, filled and/or sealed as required.
- M. Touch up any finish work requiring same after other trades are finished.
- N. Apply block filler in accordance with manufacturer's instructions. Fill all voids leaving no pinholes.
- O. It shall be distinctly understood that merely going over surfaces specified number of times, even with materials of required purity and strength, will not assure acceptance; body finish desired also involves proper application of contract materials. This result cannot be obtained by thinning good materials, using poor materials, or by adulteration. Attention is particularly drawn to requirements concerning preparation of surfaces. Acceptance of work at final inspection will be governed by body finish of materials presented at that time.
- P. Finished work shall be uniform, of approved color, smooth and free from runs, sags, defective brushing and clogging. Edges of paint adjoining other materials or colors shall be sharp and clean without overlapping. Apply materials in strict conformity with manufacturer's directions.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to mechanical and electrical sections with respect to painting and finishing requirements, color coding and identification banding of equipment, ducting, piping and conduit.
- B. Remove grilles, covers and access panels for mechanical and electrical systems from location and paint separately.
- C. Finish paint primed equipment to color selected.
- D. In exposed areas only, prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with a prefinished coating.
- E. Replace identification markings on mechanical or electrical equipment when painted over or spattered.
- F. Paint interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.
- G. Paint exposed conduit and electrical equipment occurring in finished areas. Color and texture to match adjacent surfaces.
- H. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.
- I. Color code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color banding and identification (flow arrows, naming, numbering, etc.) is provided by Division 22, 23 and 26 Contractors.

3.6 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 PAINTING AND FINISHING SCHEDULE (INTERIOR)

- A. Wood: (OTC compliant) (Baseboards, doors, door frames, exposed joists, paneling, plywood, window frames and sash, wood deck, ceiling, cabinets, partitions, etc.)
 - 1. Paint Finish - Low Luster: Acrylic pigmented sealer/undercoater not less than 39% vol. solids with 2 finish coats of 100% acrylic satin/low luster finish enamel with not less than 37% vol. solids. Total minimum DFT 3.8 mils
 - a. 1 coat primer Rich-Lux Latex Sealer Undercoater - minimum 1.4 mils DFT
 - b. 2 coats finish Rich-Lux Low Lustre Latex Enamel - minimum 1.2 mils (0.03 mm) DFT per coat
 - 2. Stain Finish: Penetrating stain with 2 finish coats of water based polyurethane finish. Total minimum DFT 3.0 mils.
 - a. 1 coat stain MAB/Zar stain
 - b. 2 coats finish McCloskey's Heirloom water based urethane Satin Wood finish - Minimum 1.2 mils DFT per coat
- B. Wood Floors and Stairs (OTC compliant)
 - 1. Stain Finish: Penetrating stain with 2 finish coats of water based polyurethane finish. Total minimum DFT 3.0 mils
 - a. 1 coat stain MAB/Zar stain
 - b. 2 coats finish McCloskey's Heirloom water based urethane Satin Wood finish - minimum 1.2 mils DFT per coat
- C. Drywall; (OTC compliant) (Gypsum wallboard ceilings and soffits)
 - 1. Paint Finish - Flat: Acrylic pigmented sealer/undercoater not less than 39% vol. solids with vinyl acetate acrylic copolymer (not PVA) with not less than 35% vol. solids. Total minimum DFT 4.0 mils
 - a. 1 coat primer Rich-Lux Latex Sealer Undercoater - minimum 1.4 mils DFT
 - b. 2 coats Rich-Lux Wal-Shield - minimum 1.2 mils DFT per coat
- D. Drywall; (LEED and OTC compliant) (Gypsum wallboard walls and fascias)

1. Paint Finish - Eggshell: Acrylic pigmented sealer/undercoater not less than 39% vol. solids with 100% acrylic eggshell enamel with not less than 35% vol. solids. Total minimum DFT 2.4 mils
 - a. 1 coat primer Rich-Lux Latex Sealer Undercoater - minimum 1.4 mils DFT
 - b. 2 coats Rich-Lux Eggshell Latex Enamel - minimum 1.2 mils DFT per coat
- E. Concrete, Concrete Block, Masonry, Stucco and Stone (LEED and OTC compliant)
1. Paint Finish - Eggshell: 100% acrylic Block filler not less than 57% vol. solids with 2 finish coats of vinyl acetate copolymer (not PVA) flat finish not less than 35% vol. solids. Total minimum DFT 2.4 mils (not incl. filler)
 - a. 1 coat filler MAB Block Kote #2000
 - b. 2 coats finish Rich-Lux Eggshell - minimum 1.2 mils DFT per coat
 2. Paint Finish - Low Luster: 100% acrylic Block filler not less than 57% vol. solids with 2 finish coats 100% acrylic satin/low luster finish enamel with not less than 37% vol. solids. Total minimum DFT 2.4 mils (not incl. filler)
 - a. 1 coat filler MAB Block Kote #2000
 - b. 2 coats finish Rich-Lux Low Lustre Latex Enamel - minimum 1.2 mils DFT per coat
- F. Concrete, Concrete Block, Masonry, Stucco and Stone (OTC compliant)
1. Paint Finish - Semi-Gloss Epoxy: 100% acrylic block filler not less than 57% vol. solids with 2 finish coats of 100% acrylic water reducible epoxy with not less than 40% vol. solids. Total minimum DFT 3.0 mils (not incl. filler)
 - a. 1 coat filler MAB Block Kote #2000
 - b. 2 coats finish Ply-Tile 530 Acrylic Epoxy, semigloss - minimum 1.5 mils DFT per coat
- G. Concrete Floors (OTC compliant)
1. Paint Finish - Gloss: Finish must be ADA compliant. Gloss latex floor enamel. Total minimum DFT 2.6 mils)
 - a. 2 coats finish Rich-Lux Patio and Deck Enamel with nonskid additive - minimum 1.3 mils DFT per coat (acid etch prior to coating)
- **OR**
2. Paint Finish - Semi-Gloss Epoxy: Finish must be ADA compliant. 2 coats of Polyamide epoxy. DFT 8.0 mils
 - a. 2 coats Ply-Mastic 650 Epoxy with nonskid additive - minimum 4.0 -8.0 mils DFT per coat.
- H. Canvas and Cotton Insulation Coverings; (OTC compliant) (pipes, ductwork, boilers, etc.)

1. Paint Finish - Flat: Vinyl acetate acrylic copolymer with not less than 35% vol. solids. Total minimum DFT 2.4 mils
 - a. 2 coats finish Rich-Lux Wal-Shield - minimum 1.2 mils DFT per coat
- I. Metal Fabrications: (OTC compliant) (Including, but not limited to Iron and steel, stairs, handrails, machinery, ornamental iron, posts, rails, radiators below 200° F., (factory primed)
 1. Paint Finish - Gloss: Anticorrosive alkyd primer with 2 finish coats of alkyd gloss finish enamel. Total minimum DFT 5.1 mils
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic finish - minimum 1.8 mils DFT per coat. Spot prime/touch-up shop prime coat

OR

 2. Paint Finish - Gloss: 100% acrylic rust inhibitive primer with 2 finish coats of 100% acrylic rust inhibitive finish. Total minimum DFT 7.6 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 2.0 mils DFT
 - b. 2 coats finish Rust-O-Lastic Acrylic Finish - minimum 2.8 mils DFT per coat
- J. Metal Fabrications: (OTC compliant) (Including, but not limited to Iron and steel, cabinets, control panels, doors, frame, fire extinguisher cabinet door and frame (factory primed)
 1. Paint Finish - Low Sheen: 100% acrylic rust inhibitive primer with not less than 36% vol. solids with 2 finish coats of 100% acrylic rust inhibitive finish with not less than 40% vol. Solids. Total minimum DFT 7.6 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 2.0 mils DFT
 - b. 2 coats finish Rust-O-Lastic Acrylic Finish - minimum 2.8 mils DFT per coat
- K. Galvanized Metal: (OTC compliant) (Ducts, doors, frames, steel deck ceilings zinc coated)
 1. Paint Finish - Semi-Gloss: 100% acrylic rust inhibitive primer with 2 finish coats of alkyd gloss finish enamel. Total minimum DFT 5.6 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 2.0 mils DFT
 - b. 2 coats finish Rust-O-Lastic finish - minimum 1.8 mils DFT per coat. Spot prime/touch up shop prime coat.

OR

 2. Paint Finish - Gloss: 100% acrylic rust inhibitive primer with not less than 36% vol. solids with 2 finish coats of 100% acrylic rust inhibitive finish with not less than 40% vol. Solids. Total minimum DFT 7.1 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic Acrylic Finish - minimum 2.8 mils DFT per coat

- L. Structural Steel (minimum corrosive elements) (OTC compliant)
1. Paint Finish - Gloss: Rust inhibitive alkyd primer free of lead and chromates with 2 finish coats of gloss enamel finish. Total minimum DFT 5.2 mils
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.6 mils DFT
 - b. 2 coats finish Rust-O-Lastic finish - minimum 1.8 mils DFT per coat
- M. Exposed, uninsulated piping and conduit throughout building, including piping around equipment and in storage spaces, corridors and mechanical rooms (OTC compliant)
1. Paint Finish - Gloss: Rust inhibitive alkyd primer free of lead and chromates not less than 43% vol. with 2 finish coats of 100% acrylic rust inhibitive finish with not less than 40% vol. solids. Total minimum DFT 7.2 mils
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.8 mils DFT
 - b. 2 coats finish Rust-O-Lastic Acrylic finish - minimum 2.8 mils DFT per coat
- N. Interior Galvanized Piping: (OTC compliant) (Neutralize before paint is applied)
1. Paint Finish - [Low Sheen] [Gloss]: 100% acrylic rust inhibitive primer with 2 finish coats of 100% acrylic rust inhibitive finish. Total minimum DFT 7.1 mils
 - a. 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - b. 2 coats finish Rust-O-Lastic Acrylic (DTM) Finish - minimum 2.8 mils DFT per coat
- O. Pumps, fans, motors and other plumbing, mechanical and electrical apparatus and equipment not shop finished, including portions of tanks, uninsulated ductwork, hangers, supports, access doors and ladders (OTC compliant)
1. Paint Finish - Gloss: Rust inhibitive alkyd primer free of lead and chromates not less than 43% vol solids with 2 finish coats of alkyd gloss finish with not less than 50% vol. solids. Total minimum DFT 5.4 mils
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.8 mils DFT
 - b. 2 coats finish Rust-O-Lastic Alkyd Finish - minimum 1.8 mils DFT per coat
 - c. 2 coats finish Rust-O-Lastic Acrylic (DTM) Finish - minimum 2.8 mils DFT per coat
- P. Conduit, wire mold, hangers in finished spaces - Paint systems specified under Miscellaneous Metal/Interior Galvanized Metal
- Q. Insulated Piping (white Kraft Jacket) (OTC compliant)
1. Paint Finish - Flat: Vinyl acetate acrylic copolymer with not less than 35% vol. solids. Total minimum DFT 2.4 mils
 - a. 2 coats Rich-Lux Wal-Shield - minimum 1.2 mils DFT per coat
- R. Equipment

1. Paint Finish: Touch-up abraded ferrous metal prime coats with a rust inhibitive alkyd primer free of lead and chromates with not less than 43% vol. solids. Touch-up Rust-O-Lastic Anti-Corrosive Primer
2. Paint Finish: Touch-up abraded galvanized metal with 100% acrylic rust inhibitive primer with not less than 36% vol. solids and finish coat with alkyd enamel with not less than 51% vol. solids
 - a. 1 coat primer Rust-O-Lastic Anti-Corrosive Primer
 - b. 1 coat finish Rust-O-Lastic Alkyd Finish

S. Exposed Materials in Ceiling-less or Open Grid Ceiling Areas (OTC compliant)

1. Paint Finish: Prime ferrous and nonferrous metal surfaces with Rust-O-Lastic Hydro Prime II. Ferrous metal with corrosion, prime with Rust-O-Lastic Alkyd Anti-Corrosive Primer.
2. Paint Finish - Flat: Vinyl acetate acrylic copolymer in [black] [or] [white]
 - a. 1 coat Master Paint or Dry Fall Latex Flat

3.8 PAINTING AND FINISHING SCHEDULE (INTERIOR EPOXY COATINGS)

A. Concrete, Concrete Block, Masonry, Stone, Brick (OTC compliant)

1. Paint Finish

- a. * 100% acrylic Block Filler not less than 57% vol. solids with 2 coats of high performance polyamine epoxy mastic semigloss not less than 90% vol. solids. Total minimum DFT 22.0 mils

- 1) 1 coat filler MAB Block Kote #2000 - minimum 12.0 -15.0 mils DFT
- 2) 2 coats finish MAB Ply-Mastic Epoxy - minimum 5.0 -7.0 mils DFT per coat

OR

- b. ** 100% acrylic Block Filler not less than 57% vol. solids with 2 coats of high build semigloss polyamide epoxy not less than 65% vol. solids. Total minimum DFT 14.0 mils (CMU). Total minimum DFT 4.0 mils (not including filler)

- 1) 1 coat filler MAB Block Kote #2000
- 2) 2 coats finish MAB Ply-Mastic 650 Epoxy - minimum 2.0 -6.0 mils DFT per coat

OR

- c. *** 100% acrylic Block Filler not less than 57% vol. solids with 2 coats of 100% acrylic water reducible epoxy with not less than 50% vol. solids. Total minimum DFT 15 mils

- 1) 1 coat filler MAB Block Kote #2000 - minimum 12.0 mils
- 2) 2 coats finish MAB Ply-Tile 530 Acrylic Epoxy [gloss] [semigloss] - minimum 1.5 mils DFT per coat

B. Ferrous Metal: (OTC compliant) (Cast iron and steel cabinets, control panels, doors, frames, handrails, ornamental iron, posts, rails, machinery sash frame and trim)

1. Paint Finish

- a. * High performance polyamine epoxy mastic primer semigloss not less than 90% vol. solids with 2 finish coats of high performance high solids aliphatic acrylic urethane not less than 66% vol. solids. Total minimum DFT 9.0 mils

- 1) 1 coat primer Sherwin Williams Macropoxy 646 - minimum 5.0 -7.0 mils DFT. All metal to be free of dirt, oil, fingerprints, drawing compound and any other contaminant prior to priming.
- 2) 2 coats finish Sherwin Williams Polyton HP - minimum 2.0 -6.0 mils DFT per coat (for 2 coat system, eliminate 1 coat of MAB Ply-Thane 890 HS)

OR

- b. ** 2 coats high build, semigloss polyamide epoxy. Total minimum DFT 6.0 mils

- 1) 2 coats finish MAB Ply-Mastic 650 Epoxy - minimum 2.0 (-6.0 mils DFT per coat

OR

- c. *** Rust inhibitive alkyd primer free of lead and chromates not less than 43% vol. solids with 2 finish coats of alkyd gloss finish with not less than 54% vol. solids. Total minimum DFT 5.4 mils

- 1) 1 coat primer Rust-O-Lastic Anti-Corrosive Primer - minimum 1.8 mils DFT
- 2) 2 coats finish Rust-O-Lastic Alkyd Finish - minimum 1.8 mils DFT per coat

OR

- 3) 2 coats Rust-O-Lastic Acrylic (DTM) Finish - minimum 2.8 mils DFT per coat

C. Galvanized and Nonferrous Metal: (OTC compliant) (Sash sills and frames, flashing, miscellaneous work, handrails, posts, rails, down pipes, etc.)

1. Paint Finish

- a. * Polyamide epoxy primer not less than 50% vol. solids with 2 finish coats of high performance high solids aliphatic acrylic urethane not less than 66% vol. solids. Total minimum DFT 6.0 mils

- 1) 1 coat primer Sherwin Williams Macropoxy 646 - minimum 4.0 -6.0 mils DFT. All metal to be free of dirt, oil, fingerprints, drawing compound and any other contaminant prior to priming.
- 2) 2 coats finish Sherwin Williams Polyton HP - minimum 2.0 -6.0 mils DFT per coat (for 2 coat system, eliminate 1 coat MAB Ply-Thane 890 HS)

****OR****

- b. * 2 coats high build, semigloss polyamide epoxy. Total minimum DFT 6.0 mils
 - 1) 2 coats finish MAB Ply-Mastic 650 Epoxy - minimum 2.0 -6.0 mils DFT per coat

****OR****

- c. * 100% acrylic rust inhibitive primer not less than 36% vol. solids with 2 finish coats of alkyd gloss finish with not less than 54% vol. solids. Total minimum DFT 5.1 mils
 - 1) 1 coat primer Rust-O-Lastic Hydro Prime II - minimum 1.5 mils DFT
 - 2) 2 coats finish Rust-O-Lastic Alkyd Finish - minimum 1.8 mils DFT per coat

****OR****

- 3) 2 coats Rust-O-Lastic Acrylic (DTM) Finish - minimum 2.8 mils DFT per coat

3.9 PAINTING AND FINISHING SCHEDULE (INTERIOR - ZERO VOC - less than 5 grams/liter)

A. Drywall (Gypsum Wallboard Ceilings and Soffits)

- 1. Paint Finish - Flat: Acrylic latex primer with not less than 35% vol. solids with 2 finish coats of acrylic latex flat with not less than 35% vol. solids. Total minimum DFT 3.6 mils
 - a. 1 coat primer Enviro-Pure Latex Primer - minimum 1.2 mils DFT
 - b. 2 coats finish Enviro-Pure Latex Flat - minimum 1.2 mils DFT per coat

B. Drywall (Gypsum Wallboard Walls and Fascias)

- 1. Paint Finish - Eggshell: Acrylic latex primer with not less than 35% vol. solids with 2 finish coats of acrylic latex eggshell with not less than 35% vol. solids. Total minimum DFT 3.6 mils).
 - a. 1 coat primer Enviro-Pure Latex Primer - minimum 1.2 mils DFT
 - b. 2 coats finish Enviro-Pure Latex Eggshell - minimum 1.2 mils DFT per coat

C. Drywall (Gypsum Wallboard)

- 1. Paint Finish - Semigloss: Acrylic latex primer with not less than 35% vol. solids with 2 finish coats of acrylic latex semigloss with not less than 38% vol. solids. Total minimum DFT 3.6 mils
 - a. 1 coat primer Enviro-Pure Latex Primer - minimum 1.2 mils DFT
 - b. 2 coats finish Enviro-Pure Latex Semi-Gloss - minimum 1.2 mils DFT per coat

D. Concrete, Concrete Block, Masonry, Stucco and Stone

1. Paint Finish - Flat: 100% acrylic block filler no less than 57% vol. solids with 2 finish coats of acrylic latex flat with not less than 35% vol. solids. Total minimum DFT 2.4 mils (not incl. filler).
 - a. 1 coat block filler Block Kote #2000
 - b. 2 coats finish Enviro-Pure Latex Flat - minimum 1.2 mils DFT per coat

E. Concrete, Concrete Block, Masonry, Stucco and Stone

1. Paint Finish - Eggshell: 100% acrylic block filler no less than 57% vol. solids with 2 finish coats of acrylic latex eggshell with not less than 35% vol. solids. Total minimum DFT 2.4 mils (not incl. filler).
 - a. 1 coat block filler Block Kote #2000
 - b. 2 coats finish Enviro-Pure Latex Eggshell - minimum 1.2 mils DFT per coat

F. Concrete, Concrete Block, Masonry, Stucco and Stone

1. Paint Finish - Semigloss: 100% acrylic block filler no less than 57% vol. solids with 2 finish coats of acrylic latex semigloss with not less than 38% vol. solids. Total minimum DFT 2.4 mils (not incl. filler).
 - a. 1 coat block filler Block Kote #2000
 - b. 2 coats finish Enviro-Pure Latex Semi-Gloss - minimum 1.2 mils DFT per coat

G. Canvas and cotton Insulation Coverings (Pipes, Ductwork, etc.)

1. Paint Finish - Flat: Acrylic latex with not less than 35% vol. solids. Total minimum DFT 2.4 mils.
 - a. 2 coats Enviro-Pure Latex Flat - minimum 1.2 mils DFT per coat

H. Metal Fabrication (Ferrous): (Including, but not limited to, doors, frames, handrails)

1. Paint Finish - Semigloss: 100% acrylic rust-inhibitive primer with not less than 36% vol. solids with 2 finish coats of acrylic latex semigloss enamel with not less than 38% vol. solids. Total minimum DFT 4.4 mils.
 - a. 1 coat primer Rust-O-Lastic Hydro-Prime II - minimum 2.0 mils DFT
 - b. 2 coats finish Enviro-Pure Latex Semi-Gloss - minimum 1.2 mils DFT per coat

I. Galvanized Metal: (Ducts, Doors, Frames)

1. Paint Finish - Semigloss: 100% acrylic rust-inhibitive primer with not less than 36% vol. solids with 2 finish coats of acrylic latex semigloss enamel with not less than 38% vol. solids. Total minimum DFT 5.2 mils.
 - a. 1 coat primer Rust-O-Lastic Hydro-Prime II - minimum 2.8 mils DFT

- b. 2 coats finish Enviro-Pure Latex Semi-Gloss - minimum 1.2 mils DFT per coat

3.10 SPORTS FACILITIES INTERIOR PAINTING AND FINISHING SCHEDULE

A. Concrete and Masonry

- 1. Exterior acrylic primer 100% with 2 finish coats of acrylic flat finish
 - a. 1st coat: MAB Sea Shore Acrylic Primer
 - b. 2 finish coats: MAB Sea Shore Acrylic House Paint
- 2. Textured waterproofing coating: 100% acrylic elastomeric coating not less than 53% vol. solids. Perm rating not less than 10.7 perms according to TT-C-555B. Tensile Strength/Elongation at Break not less than 150 psi/438% according to ASTM D2370-87
 - a. 2 coats: MAB Acra-Lastic #1400 smooth - 6.0 -10.0 mils DFT per coat

B. Concrete Block

- 1. 100% acrylic block filler with 2 finish coats of acrylic flat finish
 - a. 1st coat: MAB Block Kote #2000
 - b. 2 finish coats: MAB Sea Shore Acrylic House Paint
- 2. Textured waterproofing coating: 100% acrylic elastomeric coating not less than 53% vol. solids. Perm rating not less than 10.7 perms according to TT-C-555B. Tensile Strength/Elongation at Break not less than 150 psi/438% according to ASTM D2370-87
 - a. 2 coats: MAB Acra-Lastic #1400 smooth - 6.0 -10.0 mils DFT per coat

C. Gypsum (soffits)

- 1. Exterior acrylic primer 100% with 2 finish coats of acrylic flat finish
 - a. 1st coat: MAB Sea Shore Acrylic Primer
 - b. 2 finish coats: MAB Sea Shore Acrylic House Paint

D. Ferrous Metal (miscellaneous metals, railings, ballards, doors, frames, etc.)

- 1. Anticorrosive alkyd primer with 2 finish coats of alkyd enamel
 - a. 1st coat: MAB Rust-O-Lastic Anti-Corrosive Primer, 1.5-2.0 mils DFT
 - b. 2 finish coat: MAB Rust-O-Lastic, 1.5-2.0 mils DFT

E. Nonferrous Galvanized Metal (miscellaneous metals, railings, ballards, doors, frames, etc.)

- 1. Acrylic primer for galvanized metal with 2 finish coats of alkyd enamel
 - a. 1st coat: MAB Rust-O-Lastic Hydro Prime II, 1.5-2.0 mils DFT
 - b. 2 finish coat: MAB Rust-O-Lastic, 1.5-2.0 mils DFT

- F. Structural Steel: (structural columns and support members, canopies, miscellaneous pieces at structural work)
1. High solids epoxy mastic field primer with 2 coats of 100% acrylic urethane finish. Total minimum DFT 9 mils
 - a. Field Primer: MAB Ply Mastic Epoxy, 5 -7 mils DFT
 - b. Intermediate: MAB Ply-Thane 890 HS Acrylic Urethane, 2 -6 mils DFT
 - c. Finish: MAB Ply-Thane 890 HS Acrylic Urethane, 2-6 mils DFT
 2. Polyamide epoxy primer with finish coat of 100% acrylic urethane. Total minimum DFT 8 mils
 - a. Shop Primer: MAB Organic Zinc Epoxy, 3-5 mils DFT
 - b. Field 1st coat: MAB Ply-Mastic 650 Epoxy, 3-6 mils DFT
 - c. Finish: MAB Ply-Thane 890 HS Acrylic Urethane, 2-6 mils DFT

3.11 SPORTS FACILITIES INTERIOR PAINTING AND FINISHING SCHEDULE

- A. Concrete (Lavatories, Locker rooms, corridors, Gymnasiums, training rooms, utility, concession areas)
1. Architectural, acrylic low luster finish enamel
 - a. Primer: MAB Prime Fast
 - b. 2 finish coats: MAB Rich Lux Low Lustre Latex Enamel
 2. Architectural, acrylic gloss enamel
 - a. Primer: MAB Prime Fast
 - b. 2 finish coats: MAB Rust-O-Lastic Acrylic Maintenance Enamel
 3. Acrylic Epoxy semigloss
 - a. Primer: MAB Prime Fast
 - b. 2 finish coats: MAB Ply-Tile 530 Acrylic Epoxy
 4. 2 coats of high solids polyamide epoxy
 - a. Primer: MAB Ply-Mastic 650 Epoxy
 - b. Finish coat: MAB Ply-Mastic 650 Epoxy
- B. Concrete Block (Lavatories, Locker rooms, corridors, Gymnasiums, training rooms, utility, concession areas)
1. Architectural, acrylic Low Luster finish enamel
 - a. Filler: MAB Block Kote #2000
 - b. 2 finish coats: MAB Rich Lux Low Lustre Latex Enamel

2. Architectural, acrylic Gloss finish enamel
 - a. Filler: MAB Block Kote #2000
 - b. 2 finish coats MAB Rust-O-Lastic Acrylic Maintenance Enamel
 3. Acrylic Epoxy Semi-Gloss
 - a. Filler: MAB Block Kote #2000
 - b. 2 finish coats: MAB Ply-Tile 530 Acrylic Epoxy
 4. Acrylic block filler with 2 finish coats of high solids polyamide epoxy, semigloss finish.
 - a. Filler: MAB Block Kote #2000
 - b. 2 finish coats: MAB Ply-Mastic 650 Epoxy
- C. Gypsum (office spaces, suites, ceilings, soffits, wet areas)
1. Architectural, acrylic Flat finish (ceilings and soffits)
 - a. 2 finish coats: MAB Rich Lux Wal-Shield
 2. Architectural, acrylic eggshell finish (walls)
 3. 2 finish coats: MAB Rich Lux Latex Eggshell Enamel
 4. 2 coats of high solids polyamide epoxy, semigloss finish.
 - a. 2 finish coats: MAB Ply-Mastic 650 Epoxy
- D. Wood (office spaces, suites, suite doors, frames, trim)
1. Acrylic undercoater with 2 finish coats of 100% acrylic low luster enamel.
 - a. Primer: MAB Rich Lux Latex Sealer Undercoater
 - b. 2 finish coats: MAB Rich Lux Low Lustre Latex Enamel
 2. Prefinished Clear Finishes - are specified in Section 06200
- E. Ferrous Metal - shop primed or bare (doors, frames, miscellaneous metal fabrication)
1. Anti-Corrosive alkyd primer with 2 finish coats of alkyd enamel
 - a. Primer: MAB Rust-O-Lastic Anti-Corrosive Primer
 - b. 2 finish coats: MAB Rust-O-Lastic Alkyd finish
- F. Nonferrous Galvanized Metal (ductwork, miscellaneous metals)
1. Acrylic primer for galvanized metal with 2 finish coats of alkyd enamel
 - a. Primer: MAB Rust-O-Lastic HydroPrime II
 - b. 2 finish coats: MAB Rust-O-Lastic Alkyd finish

G. Ceiling Deck - Galvanized

1. 1 to 2 coats of latex dry fall flat
 - a. Pretreat galvanized surfaces and spot prime ferrous metal with MAB Rust-O-Lastic Anti-Corrosive Primer
 - b. Finish: MAB Master Painters Dry Fall Latex Flat
2. Direct-to-Metal acrylic finish (all colors available)
 - a. Primer: Pretreat galvanized surfaces and spot prime ferrous metal with MAB Rust-O-Lastic Anti-Corrosive Primer
 - b. Finish: MAB Rust-O-Lastic Acrylic DTM Maintenance Finish
3. Polyamide epoxy primer with finish coat of high solids polyamide epoxy
 - a. Primer: MAB Ply-Mastic 650 Epoxy
 - b. Finish: MAB Ply-Mastic 650 Epoxy

H. Ceiling Deck - shop primed

1. 1 to 2 coats of alkyd dry fall flat OR Semi-Gloss Spot Prime bare metal areas: MAB Rust-O-Lastic Anti-Corrosive Primer
 - a. Finish: MAB Master Painters Dry Fall Alkyd Flat
 - b. Finish: MAB Master Painters Dry Fall Alkyd Semi-Gloss
2. Direct-to-Metal acrylic finish (all colors available) Spot Prime bare metal areas: MAB Rust-O-Lastic Anti-Corrosive Primer
 - a. Finish: MAB Rust-O-Lastic Acrylic DTM Maintenance Finish
3. Polyamide epoxy primer with finish coat of high solids polyamide epoxy
 - a. Primer: MAB Ply-Mastic 650 Epoxy
 - b. Finish: MAB Ply-Mastic 650 Epoxy

I. Structural Steel (structural columns and support members, canopies, miscellaneous pieces at structural work)

1. Spot prime bare metal areas and finish with 2 coats of adjacent area paint.
2. High solids epoxy mastic field primer with 2 coats of 100% acrylic urethane finish. Total minimum DFT 9 mils
 - a. Field Primer: MAB Ply-Mastic Epoxy, 5 - 7 mils DFT
 - b. Intermediate: MAB Ply-Thane 890 HS Acrylic Urethane, 2 - 6 mils DFT
 - c. Finish: MAB Ply-Thane 890 HS Acrylic Urethane, 2 - 6 mils DFT

3. Polyamide epoxy primer with finish coat of 100% acrylic urethane. Total minimum DFT 8 mils

- a. Shop Primer: MAB Organic Zinc Epoxy, 3 - 5 mils DFT
- b. Field 1st coat: MAB Ply-Mastic 650 Epoxy, 3 - 6 mils DFT
- c. Finish: MAB Ply-Thane 890 HS Acrylic Urethane, 2 - 6 mils DFT

J. Concrete Floors (utility spaces and back-of house areas)

1. Clear floor sealer to provide resistance to dusting and staining. 2 coats of a single component alkyd urethane
 - a. MAB Lok-Tite Concrete Floor Sealer (QW-26)
2. 2 coats of a pigmented (colored), water-based polyamine epoxy with nonskid additive premixed. Meets ADA requirements.
 - a. Rust-Oleum Concrete Saver AS 6000 distributed by MAB

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