

**SECTION 08 1113  
HOLLOW METAL DOORS AND FRAMES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Accessories, including glazing, louvers, and matching panels.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 9113 - Exterior Painting: Field painting.
- D. Section 09 9123 - Interior Painting: Field painting

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2017.
- B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- J. ITS (DIR) - Directory of Listed Products; Current Edition.
- K. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
- L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- M. UL (DIR) - Online Certifications Directory; Current Edition.
- N. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- C. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Hollow Metal Doors and Frames:
  - 1. Ceco Door, an Assa Abloy Group company: [www.assaabloy.com/#sle](http://www.assaabloy.com/#sle).
  - 2. Republic Doors, an Allegion brand: [www.republicdoor.com/#sle](http://www.republicdoor.com/#sle).
  - 3. Steelcraft, an Allegion brand: [www.allegion.com/#sle](http://www.allegion.com/#sle).

**2.02 PERFORMANCE REQUIREMENTS**

- A. Requirements for Hollow Metal Doors and Frames:
  - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
  - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

**2.03 HOLLOW METAL DOORS**

- A. Exterior Doors: The main insulated.
  - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 1 - Standard-duty.
    - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 1 - Full Flush.
    - d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
  - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
  - 3. Door Thickness: 1-3/4 inches, nominal.
  - 4. Top Closures for Outswinging Doors: Flush with top of faces and edges.
  - 5. Door Face Sheets: Flush.
  - 6. Weatherstripping: Refer to Section 08 7100.
  - 7. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire Rated:
  - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 1 - Standard-duty.
    - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 1 - Full Flush.
    - d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
  - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.

3. Door Thickness: 1-3/4 inches, nominal.
  4. Texture: Smooth faces.
  5. Door Finish: Factory primed and field finished.
- C. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 1 - Standard-duty.
    - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 1 - Full Flush.
    - d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
  2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
    - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
    - b. Attach fire rating label to each fire rated unit.
  3. Door Thickness: 1-3/4 inches, nominal.

#### 2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. General:
1. Comply with the requirements of grade specified for corresponding door.
    - a. ANSI A250.8 Level 1 Doors: 16 gage frames.
  2. Finish: Same as for door.
- C. Exterior Door Frames: Face welded type.
1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
  2. Weatherstripping: Separate, see Section 067100.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
- E. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.

#### 2.05 ACCESSORIES

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.

#### 2.06 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

#### 3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

#### 3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 7100.

**3.04 TOLERANCES**

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

**3.05 ADJUSTING**

A. Adjust for smooth and balanced door movement.

**END OF SECTION**

NOT FOR BID

**SECTION 08 3323  
OVERHEAD COILING DOORS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Electric operators and control stations.
- B. Accelerated Action overhead coiling doors, operating hardware, and electric operation.
- C. Wiring from electric circuit disconnect to operator to control station.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 13 3419-Metal Building Systems.
- C. Section 26 - Electrical: Power for motors.

**1.03 REFERENCE STANDARDS**

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- D. UL (DIR) - Online Certifications Directory; Current Edition.
- E. UL 325 - Standard for Door, Drapery, Gate, Lower, and Window Operators and Systems; Current Edition, Including All Revisions.

**1.04 SYSTEM DESCRIPTION**

- A. Electric motor operated unit with manual override in case of power failure.
- B. Within a framed opening. Surface mounted.

**1.05 DESIGN REQUIREMENTS**

- A. Design door assembly to satisfy non-operational Design Wind Speed without undue deflection or damage to door or assembly components.
  - 1. Design Ultimate Wind Speed of 107 MPH. In the event of high sustained wind load, use auxiliary chain hoist to open door

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, electrical equipment, and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

**1.07 FIELD MEASUREMENTS**

- A. Verify that field measurements are as indicated.

**PART 2 PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Overhead Coiling Doors:
  - 1. Basis of Design; Porvene Doors, Inc.: [www.porvenedoors.com](http://www.porvenedoors.com).
  - 2. Or approved equal.
  - 3. Substitutions: See Section 01 6000 - PRODUCT REQUIREMENTS.

**2.02 COILING DOORS**

- A. Exterior Coiling Doors: Steel slat curtain.
  - 1. Basis of design: Model 422/ Accelerated Action System with chain override.
  - 2. Capable of withstanding positive and negative wind loads of 20 psf, without undue deflection or damage to components.
  - 3. Single thickness slats.
  - 4. Nominal Slat Size: 2 inches wide by required length.

### 2.03 MATERIALS AND COMPONENTS

- A. Curtain: conform to the following:
  - 1. Slats: Interlocking, minimum 22-gauge of ANSI/ASTM A653 steel, galvanized to minimum 1.25 oz/sq ft coating in accordance with ASTM A924. Cold roll formed in continuous lengths of 22 ga..
  - 2. Slat Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  - 3. Vision Lites: Rows of vision cutouts through curtain covered with clear Lexan polycarbonate. Number of rows and height as indicated on drawings.
  - 4. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
  - 5. Wear Straps: Polyester bands fitted vertically 1 per every 5 feet of curtain width.
  - 6. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
- B. Guide Construction: Two angles form a curtain guide and are bolted to a continuous wall angle. Sizes of structural steel angles are determined as required to retain curtain in guides under wind load and provide adequate mounting to jambs.
  - 1. Provide structural 3-Pc. guides with malleable endlocks.
- C. Hood Enclosure: 24-gauge galvanized steel; internally reinforced to maintain rigidity and shape.
- D. Lock Hardware:
  - 1. Slide Bolt: Provide on single jamb side, extending into slot in guides, with padlock on one side.
  - 2. Manual Chain Lift: Provide padlockable chain keeper on guide.
- E. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

### 2.04 FINISHES

- A. Curtain Slat: Galvanized steel. Pre-finished with zinc phosphate primer at manufacture.
  - 1. Powder coat finish (color as selected from RAL Chart). No field painting allowed.
- B. Steel Guides and Hood Enclosure: Galvanized steel. Pre-finished with zinc phosphate primer at manufacture.
  - 1. Powder coat finish (color as selected from RAL Chart). No field painting allowed.

### 2.05 FABRICATION

- A. Endlocks: Each end of alternate slats shall be fitted with endlocks to provide a wearing surface in the guides and to maintain slat alignment. Fastened with 1/4 inch rivets.
  - 1. Malleable Iron End-Locks: Malleable or "cast" iron end-locks shall be fitted onto every other slat.
- B. Bottom Bar: Curtain shall be reinforced with a bottom bar consisting of two 2 inch by 2 inch by 1/8 inch (50.8mm by 50.8mm by 3.21mm) structural steel angle with P.V.C. bulb astragal.
- C. Barrel: Shall be a steel pipe of diameter and wall thickness to restrict maximum deflection to 0.03 inch per foot (2.5mm/m) of door width. End bearings shall be self-lubricating ball bearings.
- D. Springs: Shall be oil tempered, grease packed helical torsion type designed with an overload factor of 25 percent. Springs mounted on a cold rolled steel inner shaft.
  - 1. High Cycle Springs: spring design is to last at least 50,000 cycles.

- E. Bracket Plates: 1/4 inch (6mm) minimum thickness steel plates to sustain and enclose ends of the door assembly.
- F. Drive end bracket plate: Fitted with a self-aligning sealed ball bearing.
- G. Guides: Shall be structural steel angles 3/16 inch (4.76mm) minimum thickness with removable head stops.
  - 1. Provide weather seal clip-on vinyl or weather stripping to seal against slat.
- H. Guide Wall Angles: 3/16 inch (4.76mm) minimum thickness structural steel angles.
- I. Hoods: Shall be 24 gauge galvanized powder coated to match slats. No field painting allowed.

## 2.06 ELECTRIC OPERATION

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by UL (DIR) or testing agency acceptable to authorities having jurisdiction.
  - 1. Provide interlock switches on motor operated units.
- B. Electric Operators:
  - 1. Mounting: Side mounted.
  - 2. Gear hoist door operator, Model Pro-GH VFD with Red/Green warning light modification as manufactured by Micanan (or approved equal); 1.5 HP, 110 volt single phase, mounted in accordance with manufacturer's specifications. Provide push button stations (interior) with radio control option.
    - a. Apparatus 2- use Wall Mounted motor, configure to clear ceiling height.
  - 3. 3-Channel Universal Receiver - Model 850LM
  - 4. Provide three (3) transmitters per door. Model 894LT.
    - a. Use four-button transmitters
      - 1) Button #1 - Open/Close apparatus door-back of station
      - 2) Button #2 - Open/Close apparatus door-street facing
      - 3) Button #3 - Open/Close rolling gate
      - 4) Button #4 - Open/Close rolling gate
  - 5. Controller Enclosure: NEMA 250, Type 4.
  - 6. Opening Speed: 7 seconds per 14' opening.
  - 7. Brake: Manufacturer's standard type, activated by motor controller.
  - 8. Manual override in case of power failure.
  - 9. Refer to Section 26.0583 for electrical connections.
- C. Interior Control Station: Recessed, standard three button (open-close-stop) control for each operator; 24 volt circuit. (NEMA 250, Type 4).
- D. Commercial Protector System (CPS):
  - 1. Provide "non-contact" photo safety sensors designed to sense an obstruction between jambs and signals for the door operator to reverse to open. (NEMA 250, Type 4).
- E. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.
  - 1. Manufacturers:
    - a. Miller Edge, Inc; -: [www.milleredge.com/#sle](http://www.milleredge.com/#sle).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that opening sizes, tolerances and conditions are acceptable.

### 3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Complete wiring from disconnect to unit components.

**3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet straight edge.

**3.04 ADJUSTING**

- A. Adjust operating assemblies for smooth and noiseless operation.

**3.05 CLEANING**

- A. Clean installed components / under provisions of Division 1.
- B. Remove labels and visible markings.

**END OF SECTION**

NOT FOR BID



**SECTION 09 9000  
PAINTING AND COATING**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
  - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
  - 2. Exposed surfaces of steel lintels and ledge angles.
  - 3. Mechanical and Electrical:
    - a. In finished areas, paint all insulated and exposed pipes, unless otherwise indicated.
    - b. Paint interior surfaces of air ducts and convectors and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
    - c. Paint dampers exposed behind louvers, grilles, and convectors and baseboard cabinets to match face panels.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 5. Non-metallic roofing and flashing.
  - 6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
  - 7. Marble, granite, slate, and other natural stones.
  - 8. Floors, unless specifically so indicated.
  - 9. Ceramic and other tile.
  - 10. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
  - 11. Glass.
  - 12. Concrete masonry in utility, mechanical, and electrical spaces.
  - 13. Acoustical materials, unless specifically so indicated.
  - 14. Concealed pipes, ducts, and conduits.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications: Shop-primed items.
- B. Section 26 0553 - Identification for Electrical Systems: Painted identification.

**1.03 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2023.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
  1. Where sheen is specified, submit samples in only that sheen.
  2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

#### **1.07 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 foot candles measured mid-height at substrate surface.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
  1. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
- B. Paints:
  1. Glidden Professional: [www.gliddenprofessional.com](http://www.gliddenprofessional.com).
  2. Vista Paint.
  - 3.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 6000 - PRODUCT REQUIREMENTS.

#### **2.02 PAINTS AND COATINGS - GENERAL**

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
  1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  2. Supply each coating material in quantity required to complete entire project's work from a single production run.

3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Volatile Organic Compound (VOC) Content:
  1. Provide coatings that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
    - b. Architectural coatings VOC limits of the State in which the Project is located.
  2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Colors: To be selected from manufacturer's full range of available colors.
  1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
  2. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

### 2.03 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP - All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board.
  1. Two top coats and one coat primer.
  2. Eggshell: MPI gloss level 3; use this sheen at all locations.
  3. Top Coat Product(s):
    - a. Dunn-Edwards.
  4. Primer(s): As recommended by manufacturer of top coats.
- B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
  1. Medium duty applications include interior railings, handrails, guardrails, balustrades, and
  2. Two top coats and one coat primer.
  3. Primer(s): As recommended by manufacturer of top coats.
- C. Paint I-OP-DF - Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck.
  1. Shop primer by others.
  2. One top coat; white.

### 2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - 1. Gypsum Wallboard: 12 percent.
  - 2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

### 3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair. Brush off walls and ceilings prior to texturing and painting.
- G. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.
- H. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### 3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- C. Apply products in accordance with manufacturer's instructions.
- D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- F. Apply each coat to uniform appearance.
- G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- H. Sand wood and metal surfaces lightly between coats to achieve required finish.
- I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### 3.04 CLEANING

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

### 3.05 PROTECTION

- A. Touch-up damaged coatings after Substantial Completion.

### 3.06 SCHEDULE - EXTERIOR SURFACES

- A. Wood - Transparent:
  - 1. One coat stain. Olympic Stain, Semi-Transparent.
  - 2. One coat sealer. As directed.

- B. Concrete, Concrete Block:
  - 1. One coat block primer. Vista Paint 018 100% Acrylic Block Filler.
  - 2. One coat primer sealer latex. Vista Paint 4600 Uniprime II.
  - 3. One coat latex paint. Vista Paint 3000 Acribond.
- C. Steel - Unprimed:
  - 1. One coat zinc chromate primer. Vista Paint 4800 Metal Pro or Carbomastic 90.
  - 2. Two coats acrylic enamel semi-gloss. Vista Paint 8400 Semi-Gloss or 7900 Premogloss or Carboline 133 VOC.
- D. Steel - Shop Primed:
  - 1. Touch-up with zinc chromate primer. Vista Paint 4800 Metal Pro or Carbozinc 90.
  - 2. Two coats alkyd enamel semi-gloss. Vista Paint 8400 Semi-Gloss or 7900 Premogloss or Carboline 133 VOC.
- E. Steel - Galvanized (where indicated):
  - 1. Pretreatment: Jasco Prep N Prime.
  - 2. One coat zinc chromate primer. Vista Paint 4800 Metal Pro or Carbozinc 90.
  - 3. Two coats acrylic enamel, semi-gloss. Vista Paint 8400 Semi-Gloss or 7900 Premogloss or Carboline 133 VOC.
- F. Pavement Markings:
  - 1. "Laycold Line Paint" or Vista Paint 6900 On-Line Traffic Marking Paint.

### 3.07 SCHEDULE - INTERIOR SURFACES

- A. Wood - Painted:
  - 1. One coat alkyd prime sealer. Vista Paint 5600 Aqua Lac.
  - 2. Two coats latex, eggshell. Vista Paint 8300 Carefree Eggshell.
- B. Wood - Transparent:
  - 1. Filler coat (for open grained wood only).
  - 2. One coat stain. VWS Series.
  - 3. One coat sealer. Valspar NAS 1820.
  - 4. One coat varnish satin. Valspar NAS 1822.
- C. Concrete:
  - 1. One coat block filler. Vista Paint 018 100% Acrylic Block Filler.
  - 2. One coat primer sealer latex. Vista Paint 4600 Uniprime II.
  - 3. One coat latex, eggshell. Vista Paint 8300 Carefree Eggshell.
- D. Steel - Unprimed:
  - 1. One coat zinc chromate primer. Vista Paint 4800 Metal Pro.
  - 2. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust-Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.
- E. Steel - Primed:
  - 1. Touch-up with original primer. Vista Paint 4800 Metal Pro.
  - 2. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.
- F. Steel - Galvanized:
  - 1. Pretreatment: Jasco Prep N Prime.
  - 2. One coat zinc chromate primer. Vista Paint 4800 Metal Pro.
  - 3. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust-Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.
- G. Plaster, Gypsum Board
  - 1. One coat alkyd primer sealer. Vista Paint 1100 High Build PVA.
  - 2. Two coats alkyd enamel, eggshell. Vista Paint 8300 Carefree Eggshell.

**END OF SECTION**

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**METAL BUILDING SYSTEMS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Manufacturer-engineered, shop-fabricated structural steel building frame.
- B. Metal wall and roof Panels, including gutters and downspouts.
- C. Metal Building Accessories: Hollow metal doors, skylights, overhead doors, louvers, etc.

**1.2 RELATED SECTIONS**

- A. Section 03 3000 – Cast-in-place concrete.
- B. Section 05 5000 – Metal Fabrications.
- C. Section 07 9200 – Joint Sealants: Sealing joints between accessory components and wall system.
- D. Section 09 9000 – Painting and Coating: Finish painting of primed steel surfaces.

**1.3 REFERENCE STANDARDS**

- A. American Institute of Steel Construction (AISC):
  - 1. AISC Specification for Structural Steel Buildings.
  - 2. AISC Serviceability Design Considerations for Low-Rise Buildings
- B. American Iron and Steel Institute (AISI):
  - 1. AISI North American Specification for the Design of Cold-Formed Steel Structural Members
- C. American Welding Society (AWS):
  - 1. AWS D1.1 / D1.1M – Structural Welding Code – Steel.
  - 2. AWS D1.3 / D1.3M – Structural Welding Code – Sheet Steel
- D. Association for Iron & Steel Technology (AISE):
  - 1. AISE 13 – Specifications for Design and Construction of Mill Buildings.
- E. ASTM International (ASTM):
  - 1. ASTM A 36 – Standard Specification for Carbon Structural Steel
  - 2. ASTM A 48 – Specification for Gray Iron Castings
  - 3. ASTM A 123 – Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - 4. ASTM A 307 – Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength
  - 5. ASTM A 325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - 6. ASTM A 354 – Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
  - 7. ASTM A 475 – Specification for Zinc-Coated Steel Wire Strand
  - 8. ASTM A 490 – Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength

9. ASTM A 500 – Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
10. ASTM A 529 – Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
11. ASTM A 563 – Specification for Carbon and Alloy Steel Nuts
12. ASTM A 572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
13. ASTM A 653 / A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
14. ASTM A 792 / A 792M – Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
15. ASTM A 992 – Standard Specification for Structural Steel Shapes.
16. ASTM A 1011 – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
17. ASTM A 1039 – Specification for Steel, Sheet, Hot Rolled, Carbon, Commercial, Structural, and High-Strength Low-Alloy, Produced by Twin-Roll Casting Process
18. ASTM E 96 / E 96M – Standard Test Methods for Water Vapor Transmission of Materials.
19. ASTM E 108—Spread-of Flame Testing: Class 1A Rating.
20. ASTM E 283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
21. ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
22. ASTM E 1592 – Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
23. ASTM E 1646 – Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference
24. ASTM E 1680 – Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems
25. ASTM E 2140 – Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
26. ASTM F 436 – Specification for Hardened Steel Washers
27. ASTM F 1145 – Specification for Turnbuckles, Swaged, Welded, Forged
28. ASTM F 1554 – Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

F. LGSI – Light Gauge Steel Institute

G. SJI – Steel Joist Institute.

H. FM Global:

1. FMRC Standard 4471 – Approval Standard for Class 1 Roofs for Hail Damage Resistance, Combustibility, and Wind Uplift Resistance

I. Metal Building Manufacturers Association (MBMA):

1. MBMA Metal Building Systems Manual

J. Underwriters Laboratories (UL):

1. UL 580 – Standard for Tests for Uplift Resistance of Roof Assemblies

## 1.4 DEFINITIONS

A. Metal Building System: A building system that will employ:

- Either a continuous or simple-span 'Z' or 'C'-shaped cold-formed purlins or open-web steel joists for support of the roof cladding.
- Either a continuous or simple-span 'Z' or 'C'-shaped cold-formed girts or open-web steel joists for support of the steel wall cladding.
- Three-plate, built-up rigid space frames and/or cold-formed 'C' or hot-rolled I-shaped post-and-beam framing to support the roof and wall secondary members.
- All systems (cladding, roof and wall secondary, lateral primary framing, and longitudinal bracing) work together to provide resistance to vertical and lateral loading demands.

- B. Gable Symmetrical: A continuous frame building with the ridge in the center of the building, consisting of tapered or straight columns and tapered or straight rafters. The sidewall girts may be continuous (by-passing the columns) or simple span (inset in the column line). The rafters may or may not have interior columns.
- C. Roof Slope: Pitch expressed as inches of rise for each 12" of horizontal run.
- D. Building Width: Measured from outside to outside of sidewall secondary structural member (girt).
- E. Building Eave Height: A nominal dimension measured from the finished floor to top flange of eave strut.
- F. Building Length: Measured from outside to outside of endwall secondary structural member.
- G. Auxiliary Loads: Dynamic loads induced by cranes, conveyors, or other material handling systems.
- H. Collateral Loads: The weight of any non-moving equipment or material, such as ceilings, electrical or mechanical equipment, sprinkler systems, plumbing, or ceilings.
- I. Dead Load: The actual weight of the building system (as provided by the metal building supplier) supported by a given member.
- J. Floor Live Loads: Loads induced on a floor system by occupants of a building and their furniture, equipment, etc.
- K. Roof Live Loads: Loads produced by maintenance activities, rain, erection activities, and other movable or moving loads but not including wind, snow, seismic, crane or dead loads.
- L. Roof Snow Loads: Gravity load induced by the weight of snow or ice on the roof, assumed to act on the horizontal projection of the roof.
- M. Seismic Loads: Loads acting in any direction on a structural system due to the action of an earthquake.
- N. Wind Loads: The loads on a structure induced by the forces of wind blowing from any horizontal direction.

## 1.5 DESIGN REQUIREMENTS

- A. General
  - 1. The building manufacturer will use standards, specifications, recommendations, findings and/or interpretations of professionally-recognized groups such as AISC, AISI, AWS, ASTM, CSA, CWB, MBMA, Federal Specifications, and unpublished research by MBMA as the basis for establishing design, drafting, fabrication, and quality criteria, practices, and tolerances. The Manufacturer's design, drafting, fabrication and quality criteria, practices, and tolerances shall govern, unless specifically countermanded by the contract documents.
  - 2. Design structural mill sections and built-up plate sections in accordance with:
    - a. (US) code-appropriate edition of AISC's "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", ANSI/AISC 360 ASD method.
  - 3. Cold-Formed steel structural members and panels will generally be designed in accordance with "Specifications for the Design of Cold-Formed Steel Structural Members", 2007 Edition, ANSI/AISI S-100-07 or CAN CSA S136-07.
  - 4. Design weldments per the following:
    - a. Structural Welding
      - 1) (US) Design per AWS D1.1, "Structural Welding Code – Steel", Latest Edition.
    - b. Cold-Formed Welding
      - 1) (US) Design per AWS D1.3, "Structural Welding Code – Sheet Steel", Latest Edition.
- B. Design Code:
  - 1. Structural design for the building structural system shall be provided by the metal building system manufacturer for the following design criteria:



- a. Governing Building Code: CBC.
- b. Year/Version: 2022.
- c. Occupancy Category: S1.

C. Design Loads:

1. Dead Load – Weight of the building system as determined by manufacturer.
2. Roof Live Load – 20 psf.
3. Collateral Load – 7 psf.
4. Roof Snow Load:
  - a. Ground Snow Load – 30 psf.
  - b. Snow Exposure Coefficient ( $C_e$ ) – 0.9, fully exposed.
  - c. Thermal Coefficient ( $C_t$ ) – 1.0, heated structure.
  - d. Roof Snow Load – 30 psf.
5. Wind Load:
  - a. Wind Speed – 120 mph.
  - b. Wind Exposure – C.
6. Seismic Load:
  - a. Spectral response acceleration for short periods ( $S_s$ ) – 1.500.
  - b. Spectral response acceleration for 1-sec. period ( $S_1$ ) – 0.600.
  - c. Site Class – D.
7. Floor Load.
  - a. Live Load – N/A.
  - b. Dead Load (Weight of Material by others) – N/A.
  - c. Collateral Load – N/A.
8. Auxiliary Loads: Auxiliary loads shall include dynamic loads, such as cranes and material handling systems, and will be defined in the Contract Documents.
9. Crane Loads:
  - a. Crane loads shall be a function of the Service Class as defined by the governing code and Crane Manufacturers Association of America (CMAA) and the rated tonnage (A- Standby or Infrequent service, B- Light service, C- Moderate service, D- Heavy Service, E- Severe Service, F- Continuous Severe Service).
  - b. Cranes in Service Class E or F shall be in accordance with AISE 13.
  - c. Service Class of Crane: N/A.
  - d. Deflection Criterion for Crane: N/A.
  - e. Crane loads will be obtained from the crane manufacturer and supplied by the Architect to the metal building system manufacturer at the time of bid.
  - f. Building structure shall be designed for the crane loads in accordance with the governing code.
  - g. Multiple cranes in the same bay or aisle shall be designed in accordance with the governing code.
  - h. If the governing code does not address multiple crane design practices, MBMA Metal Building Systems Manual shall be used.

D. General Serviceability Limits :

1. Deflection Limits shall be in accordance with the applicable provisions of the Metal Building Systems Manual (MBMA), latest edition.
2. Vertical Deflections:
  - a. Roof Secondary (Purlins) –  $L/150$ .
  - b. Main Frame roof beams –  $L/180$ .
3. Horizontal Deflections:
  - a. Wall Secondary (Girts) –  $L/90$ .
  - b. Main Frames –  $H/60$ .
4. Vertical deflection limits apply for snow load (50-year mean-recurrence interval) plus collateral load, or the code required live load. The horizontal drift and deflections limits apply for the loads induced by a basic wind speed corresponding to a 10 year mean-recurrence interval.

## 1.6 SUBMITTALS

- A. Submit under provisions of Section 01 3000 - Submittals.

- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Provide complete erection drawings for the proper identification and assembly of all building components. Drawings will show anchor bolt settings, transverse cross-sections, sidewall, endwall and roof framing, flashing, and sheeting, and accessory installation details.
- D. Certifications: Shop drawings and design analysis shall bear the seal of a registered professional engineer upon request. Design analysis shall be on file and furnished by the manufacturer upon request.
- E. Preventative Maintenance Manual.
- F. Welder's Certifications: Certification of welder qualifications shall be furnished as specified by the Project Engineer.
- G. Submit certification verifying that the metal roof system has been tested and approved by Underwriter's Laboratory as Class 90.
- H. Submit certification verifying that the metal standing seam roof system has been tested in accordance with ASTM E 1592 test protocols.

## **1.7 QUALITY ASSURANCE**

- A. Manufacturer / Fabricator Qualifications:
  - 1. All primary products specified in this section will be supplied by a single IAS AC 472 Accredited Manufacturer /Fabricator with a minimum of five (5) years' experience.
- B. Weldments/Welder/Weld Inspection Qualifications:
  - 1. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1, "Structural Welding Code – Steel", latest edition. Welding inspection and welding inspector qualification for cold-formed steel shall be in accordance with AWS D1.3, "Structural Welding Code – Sheet Steel", latest edition.
- C. Erector Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
- D. Design: Standard drawings and design analysis must bear the seal of a registered professional engineer. Design analysis must be on file and furnished by the manufacturer upon request.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
  - 1. Store and handle materials in accordance with manufacturer's instructions.
  - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
  - 3. Do not store materials directly on ground.
  - 4. Store materials on flat, level surface, raised above ground, with adequate support to prevent sagging.
  - 5. Protect materials and finish during storage, handling, and installation to prevent damage.
- C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer's absolute limits.