

**SECTION 13 34 19  
METAL BUILDING SYSTEMS**

SPEC WRITER NOTE: Delete text between  
// // not applicable to project. Edit  
remaining text to suit project.

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Pre-engineered metal building.

**1.2 RELATED WORK**

SPEC WRITER NOTE: Update and retain  
references only when specified elsewhere  
in this section.

- A. //Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS: Sustainable Design Requirements: //
- B. Section 03 30 00, CAST-IN-PLACE CONCRETE: Concrete Curbs and Foundations.
- C. Section 05 12 00, STRUCTURAL STEEL FRAMING: Structural Steel.
- D. Section 08 34 53, SECURITY DOORS AND FRAMES: Forced Entry/Ballistic-Resistant Doors and Frames.
- E. Section 08 51 23, STEEL WINDOWS: Steel Windows.
- F. Section 08 56 53, BLAST RESISTANT WINDOWS: Blast Resistant Windows and Frames.
- G. Section 08 56 59, SERVICE AND TELLER WINDOW UNITS: Forced Entry/Ballistic Resistant Rating Deal Trays.
- H. Section 08 71 00, DOOR HARDWARE: Builders' Hardware.
- I. Section 09 06 00, SCHEDULE FOR FINISHES: Color of Panels, and Other Components.
- J. Section 08 80 00, GLAZING: Glazing and Ballistic-Rated Glazing.
- K. Section 11 17 36, PACKAGE TRANSFER UNITS: Package Transfer Boxes.
- L. Section 28 13 11, PHYSICAL ACCESS CONTROL SYSTEMS: Card Readers and Biometric Devices.
- M. Section 28 16 11, INTRUSION DETECTION SYSTEM: Intrusion Alarm.  
Section 32 31 53, PERIMETER SECURITY FENCES AND GATES: Perimeter Fences and Gates.

**1.3 APPLICABLE PUBLICATIONS**

- A. Comply with references to extent specified in this section.

## B. ASTM International (ASTM):

A36/A36M-19.....Carbon Structural Steel

A242/A242M-13(2018).....High-Strength Low-Alloy Structural Steel.

A653/A653M-20.....Steel Sheet, Zinc-Coated (Galvanized) or  
Zinc-Iron-alloy-Coated (Galvannealed) by the  
Hot-Dip Process

A992/A992M-11(2015).....Structural Steel Shapes

A1008/A1008M-18.....Steel, Sheet, Cold Rolled, Carbon, Structural,  
High-Strength Low-Alloy

A1011/A1011M-18a.....Steel, Sheet and Strip, Hot-Rolled, Carbon,  
Structural, High-Strength Low-Alloy,  
High-Strength Low-Alloy with Improved  
Formability, and Ultra-High Strength

B117-19.....Operating Salt Spray (Fog) Apparatus

B209-14.....Aluminum and Aluminum-Alloy Sheet and Plate

B209M-14.....Aluminum and Aluminum-Alloy Sheet and Plate  
(Metric)

C553-13(2019).....Mineral Fiber Blanket Thermal Insulation for  
Commercial and Insulation for Commercial and  
Industrial Applications

C1036-16.....Flat glass

C1104/C1104M-19.....Determining the Water Vapor Sorption of Unfaced  
Mineral Fiber Insulation

D522/D522M-17.....Mandrel Bend Test of Attached Organic Coatings

D2244-16.....Calculation of Color Tolerances and Color  
Differences from Instrumentally Measured Color  
Coordinates

D2794-93(2019).....Resistance of Organic Coatings to the Effects  
of Rapid Deformation (Impact)

D3359-17.....Measuring Adhesion by Tape Test

D4214-07(2015).....Evaluating the Degree of Chalking of Exterior  
Paint Films

G153-13.....Operating Enclosed Carbon Arc Light Apparatus  
for Exposure of Nonmetallic Materials

## C. Metal Building Manufacturers Association (MBMA):

Recommended Guide Specifications for Pre-Engineered Metal Buildings  
Recommended Design Practices Manual

## D. American Institute of Steel Construction (AISC):

- 360-16.....Specifications for Structural Steel Buildings
- E. National Fire Protection Association (NFPA):
  - 220-18.....Standard Types of Building Construction.
- F. American Welding Society (AWS):
  - D1.1/D1.1M-20.....Structural Welding Code-Steel
- G. American Iron and Steel Institute (AISI): Cold Formed Steel Design Manual Latest Edition.
- H. UL LLC (UL):
  - 752-16.....Bullet-Resisting Equipment
- I. Department of Veterans Affairs
  - VA Physical Security Design Manual for Life Safety Protected Facilities January 2015
  - VA Physical Security Design Manual for Mission Critical Protected Facilities January 2015
- J. Protective Design Center
  - PDC-TR-08.....Single Degree of Freedom Structural Response Limits for Antiterrorism Design

**1.4 PREINSTALLATION MEETINGS**

- A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.

SPEC WRITER NOTE: Edit participant list to ensure entities influencing outcome attend.

1. Required Participants:

- a. Contracting Officer's Representative.
- b. // Architect/Engineer. //
- c. // Inspection and Testing Agency. //
- d. Contractor.
- e. Installer.
- f. // Manufacturer's field representative. //
- g. Other installers responsible for adjacent and intersecting work, including // foundation // and // \_\_\_\_\_ // installers.

SPEC WRITER NOTE: Edit meeting agenda to incorporate project specific topics.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.

- a. Installation schedule.
- b. Installation sequence.

- c. Preparatory work.
  - d. Protection before, during, and after installation.
  - e. Installation.
  - f. Terminations.
  - g. Transitions and connections to other work.
  - h. Inspecting and testing.
  - i. Other items affecting successful completion.
3. Document and distribute meeting minutes to participants to record decisions affecting installation.

### 1.5 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
  - 1. Show size, configuration, and fabrication and installation details.
  - 2. Include erection drawings and erection manuals showing complete erection layouts.
  - 3. Show steel framing location, panel lengths and markings, and other component parts corresponding with erection sequence and procedures.
  - 4. Show connections with adjoining work.
- C. Manufacturer's Literature and Data:
  - 1. Description of each product.
    - a. Metal panels.
    - b. Insulation.
    - c. Sealing materials.
    - d. Steel doors, door frames and hardware interlocking thresholds.
    - e. Windows.
  - 2. Installation instructions.
  - 3. Warranty.
- D. Samples:
  - 1. Wall and roof panels, 600 mm (24 inch) wide by 300 mm (12 inch) high sections, with factory finish in specified colors.
  - 2. Fasteners for // wall // and // roof // panels.
- E. Sustainable Construction Submittals:

SPEC WRITER NOTE: Retain sustainable construction submittals appropriate to product.

- 1. Solar Reflectance Index (SRI) for roofing.

- 2. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
- 3. Low Pollutant-Emitting Materials:
  - a. Show volatile organic compound types and quantities.
- F. Test reports: Certify // each product complies // products comply // with specifications.
  - 1. Test reports confirming // \_\_\_\_\_ // meet specified bullet resistive rating.
- G. Certificates: Certify // each product complies // products comply // with specifications.
  - 1. Zinc coating on steel panels is the specified thickness.
  - 2. Thermal values of roof and wall panels with insulation meet specified requirements.
  - 3. Indicating manufacturers and installers meet qualifications specified.
- H. Qualifications: Substantiate qualifications comply with specifications.
  - 1. Manufacturer // with project experience list //.
  - 2. Installer // with project experience list //.
    - a. Welders and welding procedures.
- I. Delegated Design Drawings and Calculations: Signed and sealed by delegated professional structural engineer registered in the state of the project.
  - 1. Include complete structural design analysis for structural components including but not limited computer model input and output and applicable load tables.
  - 2. Include manufacturer load tables indicating selected panel material, configuration and thickness meets design requirements for spans shown.
- J. Operation and Maintenance Data:
  - 1. Care instructions for each exposed finish product.

SPEC WRITER NOTE: Delete following if not applicable.

**1.6 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. Regularly manufactures specified products.
  - 2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.

- a. // Project Experience List: Provide contact names and addresses for completed projects. //
- B. Installer Qualifications: // Manufacturer authorized installer. //
  - 1. Regularly installs specified products.
  - 2. Installed specified products with satisfactory service on five similar installations for minimum five years.
    - a. // Project Experience List: Provide contact names and addresses for completed projects. //
- C. Welders and Welding Procedures Qualifications: // AWS D1.1/D1.1M. // AWS D1.3/D1.3M. //

**1.7 DELIVERY**

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, // color, // production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

**1.8 STORAGE AND PROTECTION**

- A. Stack materials stored on site before erection, covered with suitable weather tight covering. Store metal panels so that any accumulated water will drain off. Do not store panels in contact with materials that might cause staining. Materials having defects or damages that effect appearance, serviceability or use will be rejected.

**1.9 FIELD CONDITIONS**

- A. Environment:
- B. Field Measurements: Verify field conditions affecting pre-engineered metal building fabrication and installation. Show field measurements on Submittal Drawings.
  - 1. Coordinate field measurement and fabrication schedule to avoid delay.

**1.10 WARRANTY**

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one-year labor and material warranty.

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

SPEC WRITER NOTE: Specify extended manufacturer's warranties for materials only.

- B. Manufacturer's Warranty: Warrant pre-engineered metal building against material and manufacturing defects and weather intrusion.

SPEC WRITER NOTE: Specify customarily available warranty period for specified products.

- 1. Warranty Period: Two years.

**PART 2 - PRODUCTS**

**2.1 SYSTEM DESCRIPTION**

- A. Building enclosure system consisting of steel framing, metal roof and wall panels, insulation, and other integrated products specified in this section, capable of meeting specified loads and thermal criteria.

**2.2 SYSTEM PERFORMANCE**

- A. Delegated Design: Prepare submittal documents including design calculations and drawings signed and sealed by registered design professional, licensed in state where work is located.
- B. Design metal buildings complying with specified performance:
  - 1. Load Resistance: // MBMA Metal Building Systems Manual // ASCE 7 //; Design criteria as indicated on Drawings.

SPEC WRITER NOTE:

- 1. Specify actual loads when known for project.
- 2. Omit wind uplift requirements if UL is not required.

- a. Wind Uplift: UL 580; Class // 30 // 60. // 90 //.
- b. Maximum Deflection:
  - 1) Roof Framing: // 1/180 // 1/240 //.
  - 2) Roof Panel Vertical Deflection: // 1/180 // 1/240 //.
  - 3) Walls Panel Horizontal Deflection: // 1/180 // 1/240 //.
- c. Lateral Drift: Maximum // 1/200 // 1/400 // of building height.
- d. Blast Resistance: Submit calculations for review and approval prepared by qualified blast consultant, with a minimum of 5 years' experience in design of blast resistant systems. The magnitudes of the design threats //W1, W2// //GP1,GP2// are defined in the Physical Security Design Standards Data Definitions which is a document separate from the referenced VA Security Design Manual. The Physical Security Design Standards Data Definitions are provided on a need to know basis by the blast/structural engineer performing the blast design on VA

projects. It is the responsibility of the engineer of blast resistant system to request and obtain the Physical Security Design Data Standard Data Definitions from the VA Office of Construction and Facilities Management (CFM). Any associated delays or increased costs due to failure to obtain this information will be borne by the contractor

e. Blast Loads

- 1) Roofs, Building Frames and exterior walls shall be blast resistant and meet the following criteria per the VA Physical Security Design Manual for //Life Safety Protected// // Mission Critical// Facilities January 2015
  - a) Standoff Distance: //25 feet (Life Safety Protected)// 50 feet (Mission Critical Protected//
  - b) Exterior Wall Design Threat //W1 not to exceed pressure and impulse associated with GP1 threat for Life Safety Protected Buildings// //W1 not to exceed pressure and impulse associated with GP2 threat for Mission Critical Protected Buildings//
  - c) Building Frames Design Threat //W1 at the standoff distance for Life Safety Protected Buildings// //W2 at the standoff distance for Mission Critical Protected Buildings//
  - d) Roof Design Threat W1 at the standoff distance for Life Safety Protected Buildings or Mission Critical Protected Buildings
  - e) Building Frame Deformation not to exceed those defined by //B2 response for Life Safety Protected Buildings// //B1 response for Mission Critical Protected Buildings// per the Protective Design Center document PDC-TR-08 while experiencing design level pressures
  - f) Exterior Wall and Roofs Deformation not to exceed those defined by //B3 response for Life Safety Protected Buildings// //B2 response for Mission Critical Protected Buildings// per the Protective Design Center document PDC-TR-08 while experiencing design level pressures

2. Fire Resistance: ASTM E119; as component of // 1 // 2 // hour rated // door // roof // wall // assembly.

3. Insulation Surface Burning Characteristics: When tested according to ASTM E84.

SPEC WRITER NOTE: Select flame spread rating to suit occupancy type, location within project, and sprinkler coverage.

- a. Flame Spread Rating: // 25 // 75 // 200 // maximum.  
 b. Smoke Developed Rating: 450 maximum.

SPEC WRITER NOTE: Retain either U-value transmittance or R-value resistance to specify thermal performance.

4. Thermal Transmittance:

- a. Roof Panels: // \_\_\_\_\_ // U-Value (// \_\_\_\_\_ // U-Value), maximum.  
 b. Wall Panels: // \_\_\_\_\_ // U-Value (// \_\_\_\_\_ // U-Value), maximum.

5. Thermal Resistance:

- a. Roof Panels: // \_\_\_\_\_ // R-Value (// \_\_\_\_\_ // R-Value), minimum.  
 b. Wall Panels: // \_\_\_\_\_ // R-Value (// \_\_\_\_\_ // R-Value), minimum.

6. Water Resistance Wall Panels: ASTM E331; No uncontrolled penetration at // 137 Pa (2.86 psf) // \_\_\_\_\_ //, minimum, pressure differential.

7. Water Resistance Roof Panels: ASTM E1646; No uncontrolled penetration at // 137 Pa (2.86 psf) // \_\_\_\_\_ //, minimum, pressure differential.

8. Air Infiltration Resistance Wall Panels: ASTM E283; 0.3 L/s per square meter (0.06 cfm/square foot) // \_\_\_\_\_ //, maximum at // 75 Pa (1.57 psf) // \_\_\_\_\_ //, minimum, pressure differential.

9. Air Infiltration Resistance Roof Panels: ASTM E1680; 0.3 L/s per square meter (0.06 cfm/square foot) // \_\_\_\_\_ //, maximum at // 75 Pa (1.57 psf) // \_\_\_\_\_ //, minimum, pressure differential.

10. Seismic Loading: As determined by ASCE/SEI 7.

11. Auxiliary loads consisting of // crane loads // special equipment // other //.

### 2.3 MATERIALS

SPEC WRITER NOTE:

1. Update material requirements to agree with applicable requirements (types,

grades, classes, etc.) specified in the referenced Applicable Publications.

2. Include material requirements for specified forced entry/ballistic resistant ratings.
3. Coordinate color/tint/coating of glazing to accommodate required security monitoring.

- A. Steel Framing and Structural Steel Members: ASTM A36 or A242.
- B. Structural Steel Shapes: ASTM A992.
- C. Uncoated steel for light gage members: ASTM A1008 or ASTM A1011.
- D. Panels:
  1. Sheet Steel: ASTM A653/A653M, G40 zinc coating, galvanized light gage steel of specified thickness.
  2. Aluminum: ASTM B209M (ASTM B209), alloy 3004.
- E. Joint Sealant: Sealant type as recommend by manufacturer appropriate for each type of application.
- F. Sealing Tape: Manufacturer's standard in color to match metal building panels.
- G. Weather strips: Door manufacturer's standard approved products; closed cell neoprene or extruded vinyl.
- H. Thresholds: Aluminum, interlocking type.
- I. Semi rigid Insulation: Mineral fiberboard, ASTM C553, Type 2, faced with a vapor barrier having a maximum perm rating of 0.5.
- J. // Blanket Insulation: Unfaced blanket insulation, ASTM C553, Type 1 and 2 having a water vapor sorption rating less than 0.2 percent by volume or 5 percent by weight, ASTM C1104. //

#### **2.4 PRODUCTS - GENERAL**

- A. Sustainable Construction Requirements:

SPEC WRITER NOTE: Include 78 for low-slope roofs, and 29 for steep-sloped roofs.

1. Solar Reflectance Index: // 78 // 29 // minimum.

SPEC WRITER NOTE:

1. Specify products containing greatest recycled content practicable to maximize material recovery. See EPA Comprehensive Procurement Guidelines (CPG) for guidance about individual products and available recycled content. Section 01 81 13

sets overall project recycled content requirements.

2. Steel recycled content depends upon furnace type. AISC reports industry wide 32 percent for basic oxygen furnace and 93 percent for electric arc furnace.

2. Steel Recycled Content: 30 percent total recycled content, minimum.

SPEC WRITER NOTE: Aluminum Association (AA) reports 2008 industry average 85 percent recycled content for aluminum in building construction industry. Retain 50 percent when specifying anodized aluminum.

3. Aluminum Recycled Content: // 80 // 50 // percent total recycled content, minimum.

4. Insulation Recycled Content:

- a. Mineral Fiber: 75 percent total recycled content, minimum.
- b. Fiberglass: 20 percent total recycled content, minimum.
- c. Rigid Foam: 9 percent total recycled content, minimum.
- d. Glass Fiber Reinforced Rigid Foam: 6 percent total recycled content, minimum.
- e. Phenolic Rigid Foam: 5 percent total recycled content, minimum.
- f. Non-Woven Batt: 100 percent total recycled content, minimum.

SPEC WRITER NOTE: EPA CPG reports 50 - 100 percent post-consumer recycled content available in fiber (felt) for fiber composite roofing.

5. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS for the following products:

- a. Non-flooring adhesives and sealants.
- b. Aerosol adhesives.
- c. Paints and coatings.

## 2.5 FABRICATION

SPEC WRITER NOTE: Specify and add requirements for forced entry/ballistic resistant ratings.

- A. General: Coordinate fabrication and erection of work with related work of other trades. Provide cutouts and supplemental reinforcement as

required to accommodate materials and work specified in other sections of the specifications.

- B. Protection of Dissimilar Metals: Separate dissimilar materials not compatible with adjoining materials when exposed to moisture by means of coatings, gaskets, or other effective means.
- C. Steel Framework Fabrication:
1. Coordinate steel framing required for pre-engineered metal building with structural steel shown on Drawings and specified in Section 05 12 00, STRUCTURAL STEEL FRAMING. Shop fabricate columns and related components complete with connection holes for attachment of primary and secondary framing members and bracing.
  2. Framing, purlins, girts, struts and miscellaneous steel members required for attachment of pre-engineered metal building panels to building structure to be roll formed members complying with ASTM A1008/A1008M. Design, size, space and install members to meet job and loading conditions. Factory-punch members with holes and furnished complete with angle clips and fastenings required for attaching to structure.
  3. Bolted Connections: Ribbed or high-tensile steel bolts as appropriate for each connection.

SPEC WRITER NOTE: Minimum steel thickness for walls is 0.7 mm (0.0276 inch) (24 gage). Minimum steel thickness for roofs is 0.08 mm (0.0336 inch) (22 gage). Minimum aluminum thickness is 0.8 mm (0.032 inch). Check design requirements for heavier material.

- D. Wall Panels: Insulating core enclosed between two metal face sheets.
1. Steel Face Sheets: // \_\_\_\_\_ // mm (// \_\_\_\_\_ // inch) thick.
  2. Aluminum Sheets: // \_\_\_\_\_ // mm (// \_\_\_\_\_ // inch) thick.
- E. Roof Panels: // \_\_\_\_\_ // mm (// \_\_\_\_\_ // inch) thick.
- F. Design roof panels with grade of steel or aluminum and configuration of cross section capable of withstanding design load conditions without exceeding specified stress and deflection limitations, with same support configuration as that in proposed building. Apply sheets with minimum side lap of minimum one full configuration. Exposed insulation for installation on inside face of roof panels shall be semi rigid insulation.

- G. Fabricate and install Forced Entry/Ballistic Resistant (FE/BR) assemblies to achieve indicated levels of resistance. Extend resistance to include anchorages, interfaces with adjoining substrates, and hardware. Security attacks shall be unable to penetrate through closed/locked security assemblies in manner described; it is recognized that such attacks may damage units beyond repair and reuse, requiring replacement of work by Government.
- H. Flashing, Trim and Closures: Same material, gage and finish as adjacent wall and roof panels. Fastenings as specified for wall and roof panels. Form or mold closure strips to match configuration of the roofing or siding. Install closures wherever necessary to insure weather tight construction.
- I. Louvers: Fabricate wall louvers of same material, gage and finish as face sheets for wall panels. Design louver assembly to prevent infiltration of water into building. Provide insect screens and wire guards on wall louvers except omit insect screens on louvers connected to exhaust ducts.
- J. Doors and Frames: Provide doors and frames complete with weatherstrips as specified. Factory cut, reinforce, drill, and tap doors, frames and related items to receive specified hardware.
  - 1. Doors: Steel, full flush type hollow metal, minimum thickness of face sheets 1.2 mm (0.0478 inch). Equip doors with interlocking aluminum thresholds and weather strips at heads, jambs and meeting stiles.
  - 2. Door Frames: Steel, minimum 1.5 mm (0.0598 inch) thick.
  - 3. Fill and ground smooth metal surfaces of doors and frames, cleaned and prepared to receive prime coat of paint.
- K. Windows: As specified in Section 08 51 23, STEEL WINDOWS.
- L. Forced entry/Ballistic Resistant Rating: Provide resistant rating indicated for the following assemblies:

SPEC WRITER NOTE: Insert ratings required for each assembly.

- 1. Wall Panels: // \_\_\_\_\_ //
- 2. Roof Assembly: // \_\_\_\_\_ //
- 3. Doors and Frames: // \_\_\_\_\_ //
- 4. Glazing and Frames: // \_\_\_\_\_ //

## 2.6 FACTORY FINISH AND PAINTING

- A. Factory finish wall and roof panels, including related components, accessories and fastenings, as follows:
1. Prime coat weather faces of wall and roof panels, and related components with epoxy primer, and a finish coat of Polyvinylidene Fluoride baked on coating thickness of (0.8-1.3 mils) with the following performance characteristics.
    - a. Salt Spray Test: ASTM B 117, minimum // (500) // (1000) // hours. Undercutting of paint film from score line not to exceed 2 mm (1/16 inch).
    - b. Accelerated Weathering Test: ASTM G 153, Method 2, Type D apparatus minimum 2000 hours or Type EH apparatus minimum 500 hours, no checking, blistering or loss of adhesion; color change less than 5 NBS units by ASTM D 2244 and chalking less than No. 8 rating by ASTM D 4214.
    - c. Flexibility: ASTM D 522, Method A, 3 mm 1/8-inch diameter, 180 degree bend, no evidence of fracturing to the naked eye.
    - d. Adhesion: ASTM D 3359, Method B, for laboratory test and film thickness less than 0.01 mm 5 mil and Method A for site tests. Impact: ASTM D 2794, no loss of adhesion after direct and reverse impact equal to 1.5 times metal thickness in mm mils, expressed in m-kg inch-pounds.
  2. Finish on exposed face of liner panel, off white baked enamel suitable as finished surface or as base for field painting.
- B. Steel Framing Members: One coat of shop paint.
- C. Doors, Frames, and Other Similar Components: Bonderized and one prime coat of baked-on shop paint, then factory applied finish coat.
- D. Windows and Louvers: Factory finish to match adjacent wall panels.
- E. Field paint all exterior exposed fastenings to match adjacent panels.
- F. Wire brush abraded surfaces and touch up with same materials as shop prime or finish coat of paint.
- G. For color of finish coat, see Section 09 06 00, SCHEDULE FOR FINISHES.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Apply barrier coating to aluminum surfaces in contact with // dissimilar metals // and cementitious materials // to minimum 0.7 mm (30 mils) dry film thickness.

### 3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions // and approved submittal drawings //.
  - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

### 3.3 ERECTION

- A. Bolt settings and other dimensions to be held to a tolerance of plus or minus 3 mm (1/8 inch). Use templates or other gaging devices to assure accurate spacing of anchor bolts. Bolt field connections unless otherwise shown or specified.
  - 1. Accurately set bases and sill members to obtain uniform bearing and maintain established floor line elevation. Anchors and anchor bolts for securing members to concrete curb or structural steel sub-frame to be of black steel, set accurately to templates and of proper size to adequately resist applicable design loads at base.
- B. Wall Panels: Install wall panels with configurations running in vertical position. Supply panels in single lengths from base to eave with no horizontal joints, except at the junction of door units, louver panels, and similar openings. End laps for panels minimum 100 mm (four inches). Close walls at base and eave, and around doors, frames, louvers, and other similar openings by flashings and/or formed closures to assure adequate weather tightness. Flashing or stops will not be required where weather-closed or approved self-flashing panels are used.
- C. Roof Panels: Install roof panels with configurations running in direction of roof slope. Provide panels with no transverse joints except at junctions for roof openings // and at roof ridge //. Lay side laps away from prevailing winds, and seal side laps and end-laps of roof with roof joint sealant. Provide flashing // or // and // sealant // at ridge // at eaves // and rakes // at projections through roof, and elsewhere as necessary to make roof weather tight. Accomplish flashing // and //or // caulking in a manner that will assure complete weather-tightness and method to be used, subject to approval by Contracting Officer's Representative. Minimum end-laps for roofing and ridge caps // for pre-engineered and factory-punched // laps shall be 150 mm (6 inches); other minimum end-laps shall be minimum 300 mm (12 inches).

1. Install insulation on interior face of roof sheets or panels as shown on approved shop drawings. Secure materials permanently in place and free of inordinate deflection. Finish work neat, clean, uniform in appearance, and free of noticeable variations in color and texture.
- D. Fasteners for Securing Roof and Wall Panels: Fastening method, size and spacing as recommended by metal building manufacturer and as approved by Contracting Officer's Representative. Provide non-corrosive fasteners of design that will produce a weathertight connection. Clearly show fasteners and fastening method on shop and erection drawings. Field paint exterior exposed fastenings to match adjacent panels as specified in paragraph, FACTORY FINISH AND PAINTING.
  - E. Door Frame Installation: Set frames plumb and align and brace securely until permanent anchors are set. Build in wall anchors or secure to adjoining construction as indicated or specified. Where frames require overhead bracing, securely anchor to structure above.
  - F. Weatherproofing: Joints between exterior pre-engineered metal building components and other adjacent components and materials, except flashing of metal wall panels // and intersecting built-up roofs // designed to receive sealing tapes, gaskets, sealant materials, metal flashing and other methods of sealing as required to provide weathertight joints. // Workmanship for installing sealants to comply with Section 07 92 00, JOINT SEALANTS. // Install joint sealing and guarantee as specified. Color of sealing materials to match adjacent metal building components.

#### **3.4 FIELD QUALITY CONTROL**

- A. Special Inspections and Tests:
- B. Field Inspections:

SPEC WRITER NOTE: Section 01 45 29, TESTING LABORATORY SERVICES includes VA provided testing for large projects and contractor provided testing for small projects. Coordinate testing responsibility.

- C. Field Tests: Performed by testing laboratory specified in Section 01 45 29, TESTING LABORATORY SERVICES.
- D. Manufacturer Services:

#### **3.5 CLEANING**

- A. Remove excess adhesive before adhesive sets.
- B. Clean exposed surfaces. Remove contaminants and stains.

C. Touchup Painting:

1. Prepare and clean substrates according to SSPC-SP 2 or SSPC-SP 3.
2. Touch up damaged factory finishes.
3. Repair galvanized surfaces with galvanized repair paint.
4. Repair painted surfaces with touch up primer.

**3.6 ADJUSTING**

- A. Adjust doors, windows, and louvers to operate smoothly. Replace those components that do not function as intended.

- - - E N D - - -