

SECTION 07 42 63

FABRICATED WALL PANEL ASSEMBLIES  
01/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 501.1 (2005) Methods of Test for Exterior Walls

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 341 (2005; Supp 2005) Seismic Provisions for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI/COS/NASPEC (2001, Supplement 2004) North American Specification for the Design of Cold-Formed Steel Structural Members

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7-05 (2006; Errata 2007) Minimum Design Loads for Buildings and Other Structures

ASTM INTERNATIONAL (ASTM)

ASTM A 1008/A 1008M (2009a) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened

ASTM A 123/A 123M (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 36/A 36M (2008) Standard Specification for Carbon Structural Steel

ASTM A 606/A 606M (2009a) Standard Specification for Steel Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

ASTM A 653/A 653M (2009a) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

|                   |   |
|-------------------|---|
| ASTM A 755/A 755M | (2003; R 2008) Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products |
| ASTM A 780/A 780M | (2001; R 2006) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings  |
| ASTM A 792/A 792M | (2009a) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process   |
| ASTM A 924/A 924M | (2009a) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process   |
| ASTM C 273/C 273M | (2007a) Shear Properties of Sandwich Core Materials   |
| ASTM C 920        | (2008) Standard Specification for Elastomeric Joint Sealants  |
| ASTM D 1056       | (2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber   |
| ASTM D 1667       | (2005) Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell)   |
| ASTM D 522        | (1993a; R 2008) Mandrel Bend Test of Attached Organic Coatings  |
| ASTM E 119        | (2009c) Standard Test Methods for Fire Tests of Building Construction and Materials   |
| ASTM E 136        | (2009a) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C   |
| ASTM E 1592       | (2005) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference  |
| ASTM E 283        | (2004) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen                          |
| ASTM E 331        | (2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference   |
| ASTM E 84         | (2009c) Standard Test Method for Surface Burning Characteristics of Building Materials  |

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

MBMA MBSM (2002) Metal Building Systems Manual

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM AMP 500 (2006) Metal Finishes Manual

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793 (2006) Architectural Sheet Metal Manual, Sixth Edition, Second Printing

UNDERWRITERS LABORATORIES (UL)

UL 580 (2006; Rev thru Jul 2009) Tests for Uplift Resistance of Roof Assemblies

UL Bld Mat Dir (2009) Building Materials Directory

1.2 DEFINITIONS

Fabricated Wall Panel Assembly: Metal wall and liner panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories shop fabricated or field assembled for a complete weather-tight wall system.

1.3 DESCRIPTION OF FABRICATED WALL PANEL ASSEMBLY SYSTEM

Factory color finished, galvanized metal wall panel system with concealed fastening attachment. Panel profile must be as shown on drawings. Interior finish of panel assembly to be as noted on drawings. The metal wall panels shall match Federal Standard color number 36586 and trim color shall match Federal Standard color number 35109.

1.3.1 Metal Wall Panel General Performance

Comply with performance requirements, conforming to AISI/COS/NASPEC, without failure due to defective manufacture, fabrication, installation, or other defects in construction. Wall panels and accessory components must conform to the following standards:

- ASTM A 1008/A 1008M
- ASTM A 123/A 123M
- ASTM A 36/A 36M
- ASTM A 653/A 653M
- ASTM A 606/A 606M
- ASTM A 755/A 755M for metallic coated steel sheet for exterior coil pre-painted applications.
- ASTM A 780/A 780M for repair of damaged or uncoated areas of hot-dipped galvanized coating.
- ASTM A 924/A 924M for metallic coated steel sheet
- ASTM C 273/C 273M
- ASTM D 522 for applied coatings
- UL Bld Mat Dir

### 1.3.2 Structural Performance

Maximum calculated fiber stress must not exceed the allowable value in the AISI or AA manuals; a one third overstress for wind is allowed. Midspan deflection under maximum design loads is limited to L/180. Contract drawings show the design wind loads and the extent and general assembly details of the metal siding. Contractor must provide design for members and connections not shown on the drawings. Siding panels and accessories must be the products of the same manufacturer.

Provide metal wall panel assemblies complying with the load and stress requirements in accordance with ASTM E 1592. Wind Load force due to wind action governs the design for panels.

Wall systems and attachments are to resist the wind loads as determined by UL 580 and ASCE 7-05 in the geographic area where the construction will take place, in pounds per square foot.

Provide metal wall panel assembly for seismic conditions complying with the applicable requirements of AISC 341.

### 1.3.3 Air Infiltration

Air leakage must conform to the limits through the wall assembly area when tested according to ASTM E 283.

### 1.3.4 Water Penetration Under Static Pressure

No water penetration when tested according to ASTM E 331.

### 1.3.5 Water Penetration Under Dynamic Pressure

No evidence of water leakage when tested according to AAMA 501.1.

## 1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00  
SUBMITTAL PROCEDURES:

#### SD-01 Preconstruction Submittals

Qualification of Manufacturer  
Qualification of Installer

#### SD-02 Shop Drawings

Fabrication and Installation drawings for the following items are to indicate completely dimensioned structural frame and erection layouts, openings in the wall, special framing details, and construction details at corners, building intersections and flashing, location and type of mastic and metal filler strips.

Wall Panel Assemblies  
Flashing and Accessories  
Anchorage Systems

#### SD-03 Product Data

Submit Manufacturer's data indicating percentage of recycle material in wall panels to verify sustainable acquisition compliance.

Submit Manufacturer's catalog data for the following items:

- Factory Color Finish
- Closure Materials
- Insulation
- Pressure Sensitive Tape
- Sealants and Caulking
- Rated Wall Assembly
- Galvanizing Repair Paint
- Accessories

#### SD-04 Samples

Submit as required each of the following samples:

- Wall Panel Assemblies, 12 inches long by actual panel width
- Fasteners
- Metal Closure Strips, 10 inches long of each type

Submit manufacturer's color charts and chips, approximately 4 by 4 inches, showing full range of colors, textures and patterns available for wall panels with factory applied finishes.

#### SD-05 Design Data

wind design analysis

#### SD-06 Test Reports

Submit test reports for the following in accordance with the referenced articles in this section.

Coatings and base metals of metal wall type of test as specified in paragraphs entitled, "Steel Sheet Materials," and in various referenced standards in this section.

Factory Color Finish Performance Requirements

#### SD-07 Certificates

Submit certificates for the following items showing conformance with referenced standards contained in this section:

- Fasteners
- Galvanizing Repair Paint

Provide evidence that products used within this specification are manufactured in the United States.

Qualification of Manufacturer

Certify that the manufacturer of the metal wall panel system meets requirements specified under paragraph entitled "Qualification of Manufacturer."

#### Qualification of Installer

Certify that the applicator meets requirements specified under paragraph entitled "Qualification of Installation Contractor."

Submit the wall system assembly wind load and fire rating classification listings.

#### SD-08 Manufacturer's Instructions

##### Installation of Wall panels

Include detailed application instructions and standard manufacturer drawings altered as required by these specifications. Explicitly identify in writing, differences between manufacturer's instructions and the specified requirements.

#### SD-11 Closeout Submittals

##### Warranty

Instructions To:

Government and/or Contractor Personnel

Include copies of Material Safety Data Sheets for maintenance/repair materials.

### 1.5 QUALITY ASSURANCE

#### 1.5.1 Pre-Installation Conference

After submittals are received and approved but before wall panel and insulation work, including associated work, is performed, the Contracting Officer will hold a pre-siding conference to review the following:

- a. The drawings, including Fabrication and Installation drawings, showing complete Wall Panel Assemblies, and specifications.  
Include details for the following for review:

- flashing and accessories
- anchorage systems
- manufacturer's catalog data
- Factory Color Finish

Submit manufacturer's color charts and chips, approximately 4 by 4 inches, showing full range of colors, textures and patterns available for wall panels with factory applied finishes.

Closure Materials, including metal closure strips.

- Insulation
- Pressure Sensitive Tape
- Rated Wall Assembly test data
- Accessories
- Fasteners

- b. Finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

- c. Methods and procedures related to metal wall panel installation,

including manufacturer's written instructions for Installation of Wall panels, and verification of wall system assembly wind load and fire rating classification listings.

d. Support conditions for compliance with requirements, including alignment between and attachment to structural members. Provide details of wind design analysis including wind speed, exposure category, co-efficient, importance factor, designates type of facility, negative pressures for each zone, methods and requirements of attachment. Wind design analysis to include wall plan delineating dimensions and attachment patterns for each zone. Wind design analysis to be prepared and sealed by Licensed Project Engineer in the geographic area where the construction will take place.

e. Flashing, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.

f. Governing regulations and requirements for insurance, certificates, tests and inspections if applicable. Include certification for sustainable acquisition and wall system assembly wind load and fire rating classification. Safety plan review must include applicable Material Safety Data Sheets.

g. Temporary protection requirements for metal wall panel assembly during and after installation.

h. Wall panel observation and repair procedures after metal wall panel installation. Include review of sample Galvanizing Repair Paint.

i. Sample Warranty.

#### 1.5.2 Manufacturer's Technical Representative

The representative must have authorization from manufacturer to approve field changes and be thoroughly familiar with the products and installations in the geographical area where construction will take place.

#### 1.5.3 Qualification of Manufacturer

Metal wall panel system manufacturer must have:

a. A minimum of five (5) years experience in manufacturing metal wall system and accessory products.

b. Provide engineering services by an authorized engineer; currently licensed in the geographical area where construction will take place, having a minimum of four (4) years experience as an engineer knowledgeable in wind load design analysis, protocols and procedures for the MBMA MBSM; ASCE 7-05, and ASTM E 1592.

Provide certified engineering calculations using the products submitted for:

Wind load requirements in accordance with FM Wind Design Guide and ASCE 7-05.

#### 1.5.4 Qualification of Installer

The installation contractor must be approved and certified by the wall

panel manufacturer prior to beginning the installation of the metal wall system.

#### 1.5.5 Single Source

Obtain each type of metal wall and liner panels, clips, closures and other accessories from the standard products of the single source from a single manufacturer to operate as a complete system for the intended use.

#### 1.5.6 Surface-Burning Characteristics

Provide metal wall panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- a. Flame-Spread Index: 25 or less.
- b. Smoke-Developed Index: 450 or less.

#### 1.5.7 Fire-Resistance Ratings

Where indicated, provide metal wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.  
Combustion Characteristics: ASTM E 136.

#### 1.5.8 Fabrication

Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

Fabricate metal wall panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weather-tight and minimize noise from movements within panel assembly.

##### 1.5.8.1 Sheet Metal Accessories

Fabricate flashing and trim to comply with recommendations in SMACNA 1793 that apply to the design, dimensions, metal, and other characteristics of item indicated:

- a. 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.
- b. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- c. Conceal fasteners and expansion provisions where possible. Exposed

fasteners are not allowed on faces of accessories exposed to view.

d. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA or by metal wall panel manufacturer for application, but not less than thickness of metal being secured.

#### 1.5.9 Finishes

Comply with NAAMM AMP 500 for recommendations for applying and designating finishes.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

#### 1.6 DELIVERY, HANDLING, AND STORAGE

Deliver and package components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed and protected during transportation and handling.

Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.

Stack and store metal wall panels horizontally on platforms or pallets, covered with suitable weather-tight and ventilated covering 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.

Retain strippable protective covering on metal wall panel for period of metal wall panel installation.

Protect foam-plastic insulation as follows:

- a. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
- b. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

#### 1.7 PROJECT CONDITIONS

Weather Limitations: Proceed with installation preparation only when existing and forecasted weather conditions permit Work to proceed without water entering into existing walling system or building.

Field Measurements: Verify locations of wall framing and opening dimensions by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.

## 1.8 WARRANTY

### 1.8.1 1.8.1 Manufacturer's Warranty

Manufacturer shall warrant for a period of one year that the wall system materials will be free from defects. The systems contractor shall warrant for a period of two years that the installation workmanship will be free from defects.

### 1.8.2 Special Panel Finish Warranty

On manufacturer's standard form in which manufacturer agrees to repair or replace metal wall panels that evidence deterioration of the fluoropolymer finish within 20 years from date of substantial completion.

## PART 2 PRODUCTS

### 2.1 PANEL MATERIALS

#### 2.1.1 Panel Design

- a. Panel units shall consist of roll formed steel face and liner elements chemically bonded to a continuously foamed-in-place isocyanurate core.
- b. Panel edges shall be double tongue and groove design with factory applied vapor seal. Structural fasteners and clips shall be concealed within the side joint, mechanically engage both face and liner elements, and be designed to prevent crushing of the foam core during installation.
- c. Panel unit shall be a minimum of 2-1/2-inch thick in a 36-inch or 42-inch module.
- d. The panel profile shall be commonly known as MESA, with a stucco embossed exterior face, installed in a vertical pattern, with concealed fasteners:
- e. Panel shall be capable to withstand design wind pressure for a single span condition without intermediate supports.

#### 2.1.2 Material Finishes

- a. Panel exterior skin shall be ASTM A 653/A 653M, Grade 37, G90 galvanized steel in 26 gage, embossed.
- b. Panel interior skin shall be ASTM A 653/A 653M, Grade 37, G90 galvanized, white finish, in accordance with ASTM A 792/A 792M; non-directionally embossed in 26 gage.
- c. Panel exterior finish shall be fluorofinish, consisting of nominal 0.2 mil primer with a nominal 0.8 mil 70% Hylar 5000 or Kynar 500 color coat.
- d. Panel interior finish shall consist of a nominal 0.2 mil primer with a nominal 0.6 mil polyester in white finish.
- e. Urethane modified isocyanurate core shall be poured in place between the steel face and liner to fill all voids in the panel

and have the following minimum physical properties:

Density - 2.0 - 2.6 pcf  
Shear stress - 20 psi  
Compressive strength - 20 psi  
Tensile strength - 25 psi

## 2.2 FASTENERS

### 2.2.1 General

Type, material, corrosion resistance, size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten miscellaneous metal framing members to substrates in accordance with the wall panel manufacturer's and ASCE 7-05 requirements.

### 2.2.2 Exposed Fasteners

Fasteners for wall panels to be corrosion resistant coated steel, aluminum, stainless steel, or nylon capped steel compatible with the sheet panel or flashing and of a type and size recommended by the manufacturer to meet the performance requirements and design loads. Fasteners for accessories to be the manufacturer's standard. Provide an integral metal washer matching the color of attached material with compressible sealing EPDM gasket approximately 3/32 in. thick.

### 2.2.3 Screws

Screws to be corrosion resistant coated steel, aluminum and/or stainless steel being the type and size recommended by the manufacturer to meet the performance requirements.

### 2.2.4 Rivets

Rivets to be closed-end type, corrosion resistant coated steel, aluminum or stainless steel where watertight connections are required.

### 2.2.5 Attachment Clips

Fabricate clips from steel hot-dipped galvanized in accordance with ASTM A 653/A 653M, or Series 300 stainless steel. Size, shape, thickness and capacity as required meeting the insulation thickness and design load criteria specified.

## 2.3 ACCESSORIES

### 2.3.1 General

All accessories to be compatible with the metal wall panels. Sheet metal flashing, trim, metal closure strips, caps and similar metal accessories must not be less than the minimum thickness specified for the wall panels. Exposed metal accessories/finishes to match the panels furnished, except as otherwise indicated. Molded foam rib, ridge and other closure strips to be non-absorbent closed-cell or solid-cell synthetic rubber or pre-molded neoprene to match configuration of the panels.

### 2.3.2 Rubber Closure Strips

Closed-cell, expanded cellular rubber conforming to ASTM D 1056 and

Collect and place scrap/waste materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site; transport demolished materials from government property and legally dispose of them.

-- End of Section --