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## *INSULATED METAL WALL PANELS*

### GENERAL SPECIFICATION FOR COMMERCIAL/INDUSTRIAL AND ARCHITECTURAL APPLICATIONS

#### 1. **GENERAL**

##### 1.1. Summary

The contract drawings indicate the extent and general details of the walls. This section includes requirements for the factory-formed, pre-insulated, metal, wall panel cladding system and the corresponding metal flashings, sealants, fasteners, clips and other accessories.

##### 1.2. References

###### 1.2.1. AISC

Steel Construction Manual – 13<sup>th</sup> Edition

###### 1.2.2. AISI

North American Specification for the Design of Cold-Formed Structural Members, 2007

###### 1.2.3. ASCE 7

Minimum Design Loads for Buildings and Other Structures

###### 1.2.4. ASTM

*C518-10* Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

*C1363-05* Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

*C273-07* Standard Test Method for Shear Properties of Sandwich Core Materials

*D1621-10* Standard Test Method for Compressive Properties of Rigid Cellular Plastics

*D1623-09* Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics

*D1622-08* Standard Test Method for Apparent Density of Rigid Cellular Plastics

*D6226-10* Standard Test Method for Open Cell Content of Rigid Cellular Plastics

*E72-10* Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

*E84-10b* Standard Test Method of Surface Burning Characteristics of Building Materials

*E283-04* Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen

*E331-00* Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

*E1592-05* Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference

###### 1.2.5. FM Global

*4880* Approval Standard for Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems

*4881* Approval Standard for Class 1 Exterior Wall Systems

###### 1.2.6. International Building Code, 2012

### 1.3. Submittals

- 1.3.1. Manufacturer's product literature.
- 1.3.2. Shop drawings showing elevations, panel layout and calling out panel profile, thickness, gauge, width, finish and texture. The drawings shall also illustrate product components including fasteners, clips, sealants, trims and any other necessary accessories.
- 1.3.3. Engineering package illustrating the panels will resist the code stipulated loads.
- 1.3.4. Color chip and/or chart.
- 1.3.5. Installation instructions.
- 1.3.6. Sample warranties (substrate and finish).
- 1.3.7. Letter of Certification stating that all parts of this specification were satisfied.

### 1.4. Quality Assurance

- 1.4.1. Manufacturer - Shall have a minimum of five (5) years' experience in the production of continuously, foamed-in-place, insulated metal panels.
- 1.4.2. Designer – Experienced in the design of insulated metal panels and a registered Professional Engineer.
- 1.4.3. Installer - Authorized by the manufacturer and having a minimum of (3) years experience installing insulated metal wall panels.

### 1.5. Delivery, Storage and Handling

- 1.5.1. Deliver panels in the original manufacturer's weather-resistant, shrink-wrapped packaging with clearly marked, weather-resistant labeling.
- 1.5.2. Store the panels in a clean, level, protected and sufficiently compacted area. Provide ventilation if the bundles are exposed to moisture; further, elevate one end of the bundle to ensure adequate runoff. Do not stack more than two bundles high. Stack material to prevent twisting, bending, abrasion, scratching and denting.
- 1.5.3. Use proper care in unloading, storing and installing the wall panels. Handle panels in a fashion that will not bend, dent, scratch or otherwise damage the product.
- 1.5.4. Refer to the Green Span Profiles *Insulated Metal Panel Handling & Maintenance Guide* for more specific information regarding handling, storage, strippable film, steel debris, corrosion, cleaning and field painting.

### 1.6. Warranty

- 1.6.1. The manufacturer warrants the panels as free of defects in material and workmanship for a period of (2) years from the date of production. This excludes the material coatings and finishes which are covered under separate warranties.
- 1.6.2. The manufacturer warrants the GALVALUME® substrate for a period of 20-years subject to the terms and conditions set forth in the manufacturer's *GALVALUME® 20-Year Limited Warranty*.
- 1.6.3. The manufacturer warrants the Kynar 500® coating system for a period of 25-years subject to the terms and conditions set forth in the manufacturer's *Coating System Limited Warranty*.
- 1.6.4. The installer warrants the panels as free of defects in material installation and workmanship for a period of (2) years from the date of substantial completion.

### 1.7. Maintenance

- 1.7.1. Keep the interior and exterior panel surfaces clean. Immediately remove dust, dirt, mud, mortar, chalk, excess sealants or any other type of foreign substance from the panel surfaces.
- 1.7.2. Refer to the Green Span Profiles *Insulated Metal Panel Handling & Maintenance Guide* for more specific information regarding handling, storage, strippable film, steel debris, corrosion, cleaning and field painting.

## 2. **PRODUCT**

### 2.1. Manufacturer/Supplier

Green Span Profiles  
21200 FM 362  
Waller, TX 77484  
281-807-7400  
www.GreenSpanProfiles.com

### 2.2. Components

#### 2.2.1. Panels

2.2.1.1. Type: "Insulated Metal Wall Panels" consisting of roll-formed interior and exterior profiles chemically bonded to a continuously, foamed-in-place, polyisocyanurate, insulating core.

#### 2.2.1.2. Classification:

2.2.1.2.1. FM Global 4880 Approved Class 1 Fire Rated Insulated Wall/Ceiling System.

2.2.1.2.2. FM Global 4881 Approved Class 1 Exterior Wall System.

2.2.1.2.3. State of Florida Approved Building Product

2.2.1.2.4. Miami Dade County Approved

#### 2.2.1.3. *Impression*

2.2.1.3.1. Exterior profile: Impression (heavy-embossed).

2.2.1.3.2. Interior profile: MesaLine.

2.2.1.3.3. Exterior material gauge: 26 or 24.

2.2.1.3.4. Interior material gauge: 26.

2.2.1.3.5. Substrate: Galvalume®, G90 galvanized or stainless steel.

2.2.1.3.6. Panel thickness: 2, 2.5, 3 or 4-inch.

2.2.1.3.7. Panel width: 42-inch.

2.2.1.3.8. Exterior Texture: heavy embossed.

2.2.1.3.9. Interior Texture: embossed or smooth.

#### 2.2.1.4. *MesaLine*

2.2.1.4.1. Exterior profile: MesaLine.

2.2.1.4.2. Interior profile: MesaLine.

2.2.1.4.3. Exterior material gauge: 26, 24 or 22.

2.2.1.4.4. Interior material gauge: 26.

2.2.1.4.5. Substrate: Galvalume®, G90 galvanized or stainless steel.

2.2.1.4.6. Panel thickness: 2, 2.5, 3, 4, 5 or 6-inch.

2.2.1.4.7. Panel width: 42-inch.

2.2.1.4.8. Exterior Texture: embossed or smooth.

2.2.1.4.9. Interior Texture: embossed or smooth.

#### 2.2.1.5. *VeeLine*

2.2.1.5.1. Exterior profile: VeeLine.

2.2.1.5.2. Interior profile: MesaLine.

2.2.1.5.3. Exterior material gauge: 26, 24 or 22.

2.2.1.5.4. Interior material gauge: 26.

2.2.1.5.5. Substrate: Galvalume®, G90 galvanized or stainless steel.

2.2.1.5.6. Panel thickness: 2, 2.5, 3, 4, 5 or 6-inch.

2.2.1.5.7. Panel width: 42-inch.

2.2.1.5.8. Exterior Texture: embossed or smooth.

2.2.1.5.9. Interior Texture: embossed or smooth.

#### 2.2.1.6. *WaveLine*

- 2.2.1.6.1. Exterior profile: WaveLine (striated).
- 2.2.1.6.2. Interior profile: MesaLine.
- 2.2.1.6.3. Exterior material gauge: 24 or 22.
- 2.2.1.6.4. Interior material gauge: 26.
- 2.2.1.6.5. Substrate: Galvalume®, G90 galvanized or stainless steel.
- 2.2.1.6.6. Panel thickness: 2, 2.5, 3 or 4-inch.
- 2.2.1.6.7. Panel width: 42-inch.
- 2.2.1.6.8. Exterior Texture: embossed or smooth.
- 2.2.1.6.9. Interior Texture: embossed or smooth.

#### 2.2.1.7. *ShadowLine*

- 2.2.1.7.1. Exterior profile: ShadowLine (fluted).
- 2.2.1.7.2. Interior profile: MesaLine.
- 2.2.1.7.3. Exterior material gauge: 26, 24 or 22.
- 2.2.1.7.4. Interior material gauge: 26.
- 2.2.1.7.5. Substrate: Galvalume®, G90 galvanized or stainless steel.
- 2.2.1.7.6. Panel thickness: 2, 2.5, 3, 4, 5 or 6-inch.
- 2.2.1.7.7. Panel width: 42-inch.
- 2.2.1.7.8. Exterior Texture: embossed or smooth.
- 2.2.1.7.9. Interior Texture: embossed or smooth.

#### 2.2.2. Flashing

Match all flashings and trims with the adjacent panels in material gauge and finish. Install these trims per the panel manufacturer's details.

#### 2.2.3. Accessories

- 2.2.3.1. Clips – 14-ga., 4", 5-hole wall panel clip
- 2.2.3.2. Fasteners - ¼-14, Self-Drilling or Self-Tapping, Hex Head of appropriate length.
- 2.2.3.3. Closures – UV resistant per the manufacturer's details (if necessary).

#### 2.2.4. Sealers

- 2.2.4.1. Tube Sealants
  - 2.2.4.1.1. Non-skinning butyl
  - 2.2.4.1.2. Polyurethane
- 2.2.4.2. Tape Sealants – Butyl

### 2.3. System Performance

#### 2.3.1. Structural

- 2.3.1.1. Load Capacity - Determine positive and negative load resistance based on tests conducted in accordance with ASTM E 1592 and/or ASTM E 72.
- 2.3.1.2. Load Calculation – Dictated by ASCE 7 10 and the building dimensions
- 2.3.1.3. Deflection Limit – per code or L/180, whichever is greater.
- 2.3.1.4. Connection – Designed considering the load (psf), tributary area (sqft), ultimate fastener pullout/pullover (lbs.) and appropriate factor of safety.
- 2.3.1.5. Factor of Safety (panel): 2.0
- 2.3.1.6. Factor of Safety (fasteners)
  - 2.3.1.6.1. Two fasteners into steel: 2.25
  - 2.3.1.6.2. One fastener into steel or two fasteners into wood: 3.00
  - 2.3.1.6.3. One fastener into wood: 4.00
  - 2.3.1.6.4. One or two fastener into masonry: 4.00
- 2.3.1.7. Material Thickness – The delivered material thickness (steel) shall be within 95% of the design thickness.

### 2.3.2. Impact Resistance

2.3.2.1. Severe hail resistance when tested in accordance with FM Standard 4881.

2.3.2.2. Large Missile Impact tested in accordance with Miami Dade County TAS 201.

### 2.3.3. Water-tightness

Verify the panels allow no uncontrolled water penetration when subjected to a pressure differential of -20-psf when tested in accordance with ASTM E 331.

### 2.3.4. Air-tightness

Verify the panels allow no more than 0.0011 cfm/sf at a pressure differential of +/- 20-psf when tested in accordance with ASTM E 283.

### 2.3.5. Metal Facing to Foam Core Bond Strength

2.3.5.1. Fatigue – Upon being subjected to two-million alternating cycles of L/180 deflection, the panels shall exhibit no evidence of delamination of the fascia or liner elements, cracking of the foam core, or permanent set.

2.3.5.2. Freeze/Heat Cycling – At the conclusion of twenty-one (21) eight-hour temperature cycles (-20° F to 180° F), the panels shall exhibit no evidence of delamination, blistering or permanent set.

2.3.5.3. Humidity – After enduring 1200 hours of 93% humidity at a temperature of 158° F, the panels shall exhibit no evidence of delamination, blistering or interface corrosion.

2.3.5.4. Autoclave – When exposed to 218°F and a pressure of 2-psig for 2-1/2 hours, the panels shall exhibit no delamination of the foam core from the metal skins.

### 2.3.6. Energy Efficiency

When tested in accordance with ASTM C 518 the panels provide a K-factor of: 0.139 Btu-in/hr-ft<sup>2</sup>-F° @ 75° F mean temperature (R-7.20) and 0.129 Btu-in/hr-ft<sup>2</sup>-F° @ 35° F mean temperature (R-7.75).

### 2.3.7. Fire Safety

The panels will be classified according to FM 4880 for unlimited height.

### 2.3.8. Surface Burning Characteristics

Verify the panels have a maximum *Flame Spread* of 25 and maximum *Smoke Developed* of 450 when tested in accordance with ASTM E84.

### 2.3.9. Material Compatibility

Prevent galvanic action of dissimilar metals. This includes but is not limited to any direct contact of panels and/or trim with treated lumber or copper lightning attenuation equipment or indirect contact constituted by water runoff from HVAC drain-lines, etc.

### 2.3.10. Finish

2.3.10.1. Humidity

2.3.10.2. Salt Spray

2.3.10.3. Color Retention

2.3.10.4. Chalk Resistance

2.3.10.5. Gloss Retention

2.3.10.6. Dry Adhesion

2.3.10.7. Flexibility

## 3. **EXECUTION**

### 3.1. General

The Erector, upon entering into a contract to erect the Wall Panel System, claims itself competent in the erection of these systems and is responsible for complying with all applicable local federal and state construction and safety regulations, including OSHA regulations.

- 3.2. Preparation
  - Erector - Before wall panel installation begins, meticulously review and accept the shop drawings as correct.
- 3.3. Examination
  - 3.3.1. Shipment - Immediately upon delivery of the wall panels and accessories, crosscheck the delivered materials against the shipper to insure a complete shipment.
  - 3.3.2. Substrate – Before installation begins, inspect and accept the structure with regard to plumb, level and true. The maximum deviation of steel alignment shall be limited to 0 (+\-) 3/16” from the control with a 1/8” maximum change in deviation for any member of any 10-ft panel run. The erector shall not proceed with installation if the structural steel is not within the specified tolerances.
  - 3.3.3. Panels – During installation, examine the individual panels. Immediately notify the manufacturer of any panel defects. Do not install defective panels.
- 3.4. Installation
  - 3.4.1. Panels
    - Install in accordance with the manufacturer’s recommended procedures, details and the construction drawings. Install the panels plumb, level and true. If necessary, make panel cuts with a “metal cutting” circular saw.
  - 3.4.2. Fasteners
    - Install fasteners in the locations shown on the construction drawings. Take care not to overdrive fasteners. Replace stripped fasteners by installing a new fastener in a different location.
  - 3.4.3. Trim
    - Install the flashing true-to-line and level or plumb and in accordance with the manufacture’s details and the construction drawings.
  - 3.4.4. Sealants
    - Before sealants are applied, clean and prime the surfaces according to the sealant manufacturer’s guidelines. Locate the sealants per the manufacturer’s details and the shop drawings without skips or voids.
  - 3.4.5. Manual
    - Refer to the Green Span Profiles *Installation Guide* for specific information regarding accountability, conditions, heavy equipment, verification of structure, alignment, side-joints, vapor barrier, sealants, field applied insulation, threaded fasteners, strippable film, field cutting, appearance, general installation sequence and details.
- 3.5. Protection
  - Remove any and all strippable films either prior to or directly following installation. Take measures to avoid exposure of the film to direct sunlight for more than 24 hours.
- 3.6. Cleaning
  - 3.6.1. Touch Up – “Touch up” minor damage to factory applied finishes using factory approved, matching coatings provided by the manufacturer.
  - 3.6.2. Soap - If necessary, clean panel surfaces with a combination of water and a light detergent.

**END OF SECTION**