

# **SECTION 07412 – COMPOSITE METAL WALL PANEL SYSTEM (Accu-Trac® Low Profile ES System)**

## **PART 1 – GENERAL**

### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Metal-faced composite wall panels and related components.
- B. Related Sections include the following:
  - 1. Division 5 Section “Cold-Formed Metal Framing” for secondary support framing supporting metal wall panels.
  - 2. Division 7 Section “Joint Sealants” for field-applied sealants not otherwise specified in this Section.
  - 3. Division 7 Section \_\_\_\_\_ for vapor barrier and/or moisture barrier.

### **1.3 DEFINITIONS**

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

### **1.4 PERFORMANCE REQUIREMENTS**

- A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers’ standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

- B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq.ft. of wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq.ft.
- C. Water Penetration: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 15 psf.
- D. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330-84:
  - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
    - a. Uniform pressure of 60 psf, inward or outward.
  - 2. Deflection Limits: Engineer metal wall panel assemblies to withstand test pressures with deflection no greater than 1/180 perimeter and L/60 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.4 percent of the clear span.
- E. Cyclic Wind Pressure: ASTM E 1886-02. Provide metal panel wall system that has been tested and passed ASTM E 1886-02 with a minimum design pressures of positive and negative 50 psf when impacted by missile(s) and exposed to and completed 9,000 cycles of cyclic pressure differentials which show no resultant failure or duress.
- F. Large Missile Impact: Provide metal panel system which has been tested to and is compliant with the requirements of TAS201, 202 and 203. Panel system shall have achieved “pass” status without the use of supplemental materials such as plywood or panel stiffeners. **(If applicable).**
- G. Fire-Resistance Ratings: Where fr core is indicated, provide metal wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 and NFPA 285 by a testing and inspecting agency acceptable to authorities having jurisdiction
- H. Surface-Burning Characteristics: Provide metal wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 under another testing and inspecting agency acceptable to authorities having jurisdiction: (Choose one)

1. FR Core:
  - a. Flame-Spread Index: 0
  - b. Smoke-Developed Index: 10

**Or**

2. PE Core
  - a. Flame –Spread Index 0
  - b. Smoke-Developed Index 0

## 1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
  1. Accessories: Include details of all integral panel components and their interface with adjacent materials.
  2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation. (Optional)
- C. Samples for Initial Selection: For each type of metal wall panel indicated with factory-applied color finishes.
  1. Include manufacturer’s standard color charts consisting of strips of cured sealants showing the full range of colors available for each sealant exposed to view.
  2. Include manufacturer’s standard color charts showing full range of colors available, in specified finish type, for the metal panel system.
- D. Samples for Verification:
  1. Metal Wall Panels: Two (2) each, six inches by ten inches minimum, panel samples with joinery included as part of the sample.
  2. Accessories: Twelve-inch long samples for each type of accessory.

3. Exposed Sealants: For each type and color of joint sealant required. Install joint sealants in ½-inch wide joints formed between two (2) sixinch long strips of material matching the appearance of metal wall panels adjacent to joint sealants.
- E. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:
1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
  2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:
1. Metal Panels: Include reports for air infiltration, water penetration, structural performance.
- G. Maintenance Data: For metal wall panels to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.

## 1.6 QUALITY ASSURANCE

- A. Panel System Fabricator:
1. System Fabricator's responsibilities include engineering and fabricating metal wall panel assemblies and when required, provide professional engineering services needed to assume engineering responsibility.
  2. Fabricator shall have a minimum of 5 years experience with the fabrication of ACM panels.
  3. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by the fabricator, not a subcontractor.
- B. Fabrication Location: Panels to be factory assembled at Fabricator's plant/shop. Panels shall not be assembled on-site.
- C. Installer: Must be certified by metal-faced composite wall panel Fabricator to install Fabricator's wall panel system.

- D. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- E. Source Limitations: Obtain each type of metal wall panel through one source from a single fabricator.
- F. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels and are based on the specific system indicated.
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Management and Coordination”. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
  - 1. Meet with Owner, Architect, Owner’s insurer if applicable, testing and inspecting agency representative, metal wall panel installer, metal wall panel fabricator’s representative, structural-support installer, and installers whose work interfaces with or affects metal wall panels including installers of doors, windows, and louvers.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal wall panels installation, including fabricator’s written instructions.
  - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
  - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
  - 6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
  - 7. Review temporary protection requirements for metal wall panel assembly during and after installation.
  - 8. Review wall panel observation and repair procedures after metal wall panel installation.
  - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels on platforms, pallets, or within crates, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Leave protective strippable film as applied by ACM sheet manufacturer on panel face throughout fabrication and installation. Remove only after panels are installed and not subject to damage.

## 1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including rupturing, cracking, or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER: ACM – ALUMINUM COMPOSITE MATERIAL

- A. Products from the following manufacturers will be accepted provided that they meet requirements of this specification:
- a. ALFREX FR. By ALFREX
  - b. Alpolic, a Division of Mitsubishi Plastics Composites America, Inc.
  - c. Alucobond, by 3A Composites USA, Inc.
  - d. Reynobond, by Alcoa
  - e. Larson, by Alucoil
  - f. Architect approved prior to bid

### 2.2 FABRICATOR: PANEL SYSTEM

- A. The following requirements apply for product selection:
1. Fabricator: Subject to compliance with requirements, provide products by the fabricators specified. Other fabricators must be approved by architect 2 weeks prior to bid.
    - i Altech Panel Systems (678-721-4569). System: Accu-Trac® Low Profile ES system.
    - ii CENTRIA Formabond II
    - iii Sobotec SL 1000

### 2.3 PANEL MATERIALS

- A. Composite Metal Panel System:
1. Exposed Sealant System:

- a. Panel system shall be nominal one and one half (1 ½”) depth with shop applied, concealed continuous perimeter extrusions. (Note: Intermittent extrusions at panel perimeter are not acceptable.) Panel system shall employ shop attached clips with sliding capability for exact location over supports, while allowing for thermal movement in all four directions. To minimize thermal stresses on the panels, fixed attachment type clips will not be acceptable.
- b. Panel system shall have nominal 1/2” vertical and horizontal joinery. Joint sealants to be provided and installed per Specification Section \_\_\_\_\_. Sealant color shall be Dow 795 Silicone or approved equal
- c. Panel system shall be fabricated in a shop environment. Field assembled systems are not permissible.
- d. Panel system shall be provided in panel modules and lengths as indicated on the Contract drawings (up to 60” in the short direction and up to 240” in the long direction).
- e. Standard route and return systems with fixed fastening through fixed perimeter extrusions or clips shall not be permitted.
- f. All panel corners shall be reinforced with aluminum angles
- g. All routed folds shall be reinforced with angles or extrusion system
- h. Panel system shall be provided in panel modules and lengths as indicated on the Contract drawings (up to 60” in the short direction and up to 240” in the long direction).
- i. Panel system to be applied over properly installed vapor and/or moisture barrier. See Section 07156- Self-Adhering Sheet Waterproofing.

**B.** ACM – Aluminum Composite Material: Formed with 0.020-inch thick coilcoated aluminum sheet facings. ACM sheets to be formed in a continuous, in-line process:

- 1. ACM Thickness: 0.157 inch (4 mm)
- 2. Core: Fire Retardant Fire Resistant (FR) or standard (PE) (**Choose one**)
- 3. Bond Strength: (ASTM D-1781): 22 in-lb/in minimum
- 4. Finishes shall consist of a fluoropolymer paint finish that complies with AAMA 2605 standards.
- 5. Exposed Finish – (**Choose One**):

2-Coat Fluoropolymer:

- (1) .8 mil nominal coil coated color coat with a Lumiflon based fluoropolymer paint finish. Color coat to be applied over .2 mil nominal coil coated primer coat.
- (2) Color to be selected by Architect from manufacturer's standard non-metallic colors.

b. 3-Coat Fluoropolymer:

- (1) .8 mil coil coated clear coat with a Lumiflon based fluoropolymer paint finish applied over .8 mil color coat also with a 70% fluoropolymer paint finish. Fluoropolymer based coats to be applied subsequent to .2 mil nominal coil coated primer coat.
- (2) Color to be selected by Architect from manufacturer's standard metallic or non-metallic colors.

c. 2-coat Mica:

- (1) .8 mil nominal coil coated color coat containing pearlescent flakes within a Lumiflon based fluoropolymer paint finish. Color coat to be applied over .2 mil coil coated primer coat.
- (2) Color to be as selected by Architect from manufacturer's standard Mica colors.

6. Backside/Concealed Finish: Backside of panels to be coated with manufacturer's standard backside washcoat.

## 2.4 ACCESSORIES

A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, splines, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.

## 2.5 FABRICATION

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

1. Form panel lines, breaks and angles to be sharp and true, with surfaces free from warp and buckle.

- B. Fabricate metal wall panels in a manner that would weep any possible condensation to the exterior.
- C. Provide panel profile for full length of panel.
- D. Fabricate metal wall panel joints in a manner that will minimize noise from movements within panel assembly.
- E. Metal-Faced Composite Wall Panels:
  - 1. Fabricate panels, as required to comply with deflection limits, without the use of backside panel stiffeners (**when applicable**).
  - 2. Fabricate panels with sharply cut edges, with no displacement of face sheets or external exposure of core material.
  - 3. Dimensional Tolerances:
    - a. Length: Plus 0.375 inch (9.5 mm).
    - b. Width: Plus 0.188 inch (4.8 mm).
    - c. Thickness: Plus or minus 0.008 inch (0.2 mm).
    - d. Panel Bow: 0.8 percent maximum or panel length or width.
    - e. Squareness: 0.2 inch (5 mm) maximum.

## 2.6 FINISHES, GENERAL

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

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.
  - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 COMPOSITE WALL PANEL INSTALLATION, GENERAL

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on approved shop drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
- B. Install attachment system required to support wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, panel clips, and anchor channels as may be required.
1. Include attachment to supports, panel-to-panel joinery, panel-to dissimilar-material joinery, and panel-system joint seals.
  2. Do not begin installation until water barrier and flashings that will be concealed by composite panels are installed. (See Section \_\_\_\_\_.)
- C. Clip Installation: Attach integral panel clips to supports at locations, spacings, and with fasteners recommended by system fabricator. Panel clips to be attached to panels at the factory in lieu of field applied.
1. Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Division 7 Section "Joint Sealants".

### 3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4-inch in 20-feet (6-mm in 6-m), non-accumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

### 3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION 07412