

Section 07 42 13
ZINC COMPOSITE METAL WALL PANELS

PART I: GENERAL

I.01 SCOPE

- A. Section Includes
 - 1. MCM – Fire-Resistant Composite Material Panels
 - 2. Panel system requirements of composite fire resistive panels including exterior and interior installation assemblies, components, and accessories.
- B. Related Sections: Section(s) related to this section include:
 - 1. Division 05 Metal Framing Sections
 - 2. Division 07 Air and Vapor Barrier
 - 3. Division 07 Flashing and Trim Sections
 - 4. Division 07 Joint Treatment Section
 - 5. Division 08 Aluminum Windows Section
 - 6. Division 08 Glass and Glazing Section
 - 7. Division 08 Curtain Wall Sections

I.02 QUALITY ASSURANCE

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed have either been identified by the International Building Code (IBC), local building code, or specific requirement for this building construction type.
- B. American Society for Testing and Materials (ASTM) International
 - 1. ASTM B69 Standard Specification for Rolled Zinc
 - 2. ASTM D1781 Standard Test Method for Climbing Drum Peel for Adhesives
 - 3. ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
 - 4. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 5. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
 - 6. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
 - 7. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Curtain Wall, and Doors by Uniform Static Air Pressure Difference
- C. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA 509 Voluntary Test and Classification Method of Drained and Back Ventilated Rain Screen Wall Cladding Systems.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

I.03 SYSTEM DESCRIPTION

- A. Performance Requirements:
1. Provide installed MCM system designed to withstand specified loadings while maintaining allowable deflection, thermal movement performance as defined by the Manufacturer, Fabricator, or Installer required by this section without defects, damage, or failure.
- B. Deflection and Thermal Movement: Provide installed MCM systems that have been designed to resist to the wind loading, acting inward and outward.
1. Perimeter Framing Deflection: Deflection of panel perimeter framing member shall not exceed $L/175$ normal to plane of the wall where L is the unsupported span of the perimeter framing member.
 2. Panel Deflection: Deflection of the panel face shall not exceed $L/60$ at design load where L is the unsupported span of the panel.
 3. Anchor Deflection: At connection points of framing members to anchors, anchor deflection in any direction shall not exceed 0.0625 inch (1.6 mm).
 4. At 150% pressure, no permanent deformation exceeding $L/1000$ or failure to structural members is permitted.
 5. Thermal Movements: Allow for free and noiseless horizontal and vertical thermal movement due to expansion and contraction of component parts over a temperature range of -20°F (-29°C) to $+180^{\circ}\text{F}$ (82.2°C) at the material surface.
 - a. Buckling, opening of joints, undue stress on fasteners, failure of sealants, or any other detrimental effects of thermal movement will not be permitted.
 - b. Fabrication, assembly and erection procedures shall take into account the ambient temperature range at the time of the respective operation.
- C. Water and Air Leakage: Provide systems that have been tested and certified to conform to the following criteria:
1. ASTM E283: Air Leakage - Not more than 0.06cfm per ft² of wall area (0.003L/s m²) when tested at 6.24psf (300Pa)
 2. ASTM E331: Static Water Penetration - When tested under static pressure at 12.0 psf (575 Pa) minimum, for a time period of 15 minutes. MCM systems must have:
 - a. No uncontrolled water leakage to the room side of the assembly when tested as
 3. AAMA 501.1 - Dynamic Water Penetration - When tested with a wall pressure equivalent to 12.0 psf (575 Pa) for a time period of 15 minutes, the MCM system must have:
 - a. No uncontrolled water leakage to the room side of the assembly when tested as defined by the procedure.
 4. ASTM E330 - Structural Performance - MCM system must be engineered to meet the project design loads, however the MCM system must meet or exceed the following criteria when tested to a minimum pressure of 30.0 psf (1436 Pa):
 - a. Deflections do not exceed limitations defined within the section on Deflection and
- D. Fire Performance: Where required by governing code, provide fire retardant MCM that has been evaluated and is in compliance with code requirements specified herein.
- a. Fire Performance: Wall assemblies containing MCM System shall meet the requirements of the Intermediate Scale Multi-story test, NFPA 285, where required by code based for the design of this project.

I.04 SUBMITTALS

- A. Submit in accordance with Conditions of the Contract and Division 01 Submittal Procedures Sections.
- B. Submit product data, including manufacturer's brochures and Spec-Data Sheets.
- C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.

- D. Samples: Submit selection and verification samples for finishes, colors and textures.
 - 1. Selected Samples: Manufacturer's color charts or chips illustrating full range of colors, finishes and patterns available for composite metal panels with factory applied finishes.
 - 2. Verification Samples:
 - a. Panel System Assembly: Two samples of each assembly 12 inch x 12 inch (304 x 304 mm)
 - b. Two samples of sample ZCM sheets, or single-skin zinc sheet used in the manufacture thereof, not less than 3 inches x 4 inches (76 mm x 102 mm).
- E. Quality Assurance Submittals - Submit the following:
 - 1. Product Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties, or a third-party listing documenting compliance to a comparable code section.
 - 2. Product Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
 - 3. Manufacturer's Product Literature.
 - 4. Manufacturer's Field Reports: Manufacturer's field reports.
- F. Closeout Submittals: Submit the following:
 - 1. Warranty: Warranty documents specified.

I.05 QUALITY ASSURANCE

- A. MCM Manufacturer Qualifications
 - 1. MCM Manufacturer Qualifications: Company with a minimum of 10 years of continuous experience manufacturing MCM of the type specified.
 - a. Able to provide specified warranty on finish.
 - b. Able to provide a list of other projects of similar size, including approximate date of installation and name of Architect for each.
 - c. Able to produce the composite material without outsourcing of the fire-resistant core manufacture and compounding, or panel bonding process.
- B. MCM Fabricator Qualifications
 - 1. MCM system fabricator will have at least (3) years of continuous documented experience fabricating the panel material type specified.
 - 2. MCM system fabricator will have been in business under its present name for at least five (5) years prior to the start of this project.
 - 3. MCM system fabricator will be capable of providing field service representation during construction.
 - 4. MCM system fabricator will not have filed for protection from creditors under state or federal insolvency or debtor relief statutes or codes
- C. MCM System Installer Qualifications
 - 1. MCM system fabricator will have been in business under its present name for at least five (5) years prior to the start of this project and have experience with similar sized MCM system projects.
 - 2. MCM system fabricator will be capable of providing field service representation during construction.
 - 3. The MCM System Installer must be an approved installer by the MCM Fabricator for the installation of their MCM System and have undergone proper training for the specified system thereof.
- D. Mock-Up
 - 1. At location on building and to extent directed by Architect, install areas of specified wall panels, support framing, flashing, trim and accessories to show:
 - a. Substrate preparation
 - b. Support framing, furring, and flashing
 - c. Clearances and gaps between members
 - d. Fastening methods
 - e. Trim details
 - f. Joint protection
 - g. Workmanship

2. Prepare mock-up for Architect's approval before start of wall panel work. Prepare additional mock-ups, if required by Architect, until approved.
 3. Maintain approved mock-up during construction to establish required standard of workmanship and basis of comparison for installation of wall panel work. Approved mock-up may remain as part of finished work.
- E. Installation Documents On-Site
1. Maintain copies of installation instructions, approved submittals and other execution related documents on-site; make available as needed to confirm proper installation.
- F. []

I.06 DELIVERY, STORAGE & HANDLING

- A. Adhere to manufacturer's ordering instructions and lead time requirements to avoid delays.
- B. Deliver materials to fabricator in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect finish of panels by applying heavy-duty removable plastic film during production.
- D. After fabrication, package composite wall panels for protection against transportation damage.
- E. Store material in accordance with manufacturer's guidelines.
1. Exercise care unloading, storing and installing panels to prevent bending, warping, twisting and surface damage to the factory applied finish.
 2. Store materials protected from exposure to harmful weather conditions, out of direct sunlight when unpackaged, and at temperatures not to exceed 120 degrees F.
 3. Protect panels from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
 4. Slope panels to ensure positive drainage of any accumulated water.
 5. Avoid contact with any other materials that might cause staining, denting or other surface damage to the factory applied finish.

I.07 WARRANTY

- A. Manufacturer's Warranties: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
- B. Warranty Periods:
1. Panel Integrity: 10 years commencing on Date of Substantial Completion.
 2. Zinc-Alloy Natural Metal: No finish warranty.

PART 2: PRODUCTS

2.01 FIRE RESISTANT METAL COMPOSITE MATERIAL (MCM)

- A. Fire Resistant Metal Composite Material (MCM) Manufacturer
 - I. Alfrex, Inc. 943 Gainesville HWY, Building 100, Suite 4000, Buford, GA 30518
 - Phone (470) 589-7449
 - Website: <http://alfrexusa.com/>
 - Email: alfrex@alfrexusa.com

2.02 BASIS OF DESIGN

- A. Alfrex FR Zinc | Zinc Composite Material (ZCM)
- B. Description: Two sheets of pre-weathered zinc sandwiching a solid core of extruded thermoplastic fire resistant material formed in a continuous process with no glues or liquid adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products that are laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.
- C. MCM Thickness:
 - I. 4mm (0.157 inch)
- D. Zinc-Alloy: > 99.995% Zinc
- E. ZCM Width and Face Sheet Thickness:
 - 1. Panel module widths up to 50" (1270mm) wide x module length
 - a. Front Face: 0.7mm (0.028") nominal
 - b. Fire Resistant Mineral Core: 2.6 mm (0.102 inch)
 - c. Back Face: 0.7mm (0.028") nominal
 - 2. Panel module widths up to 36" (914mm) wide x module length
 - a. Front Face: 0.5mm (0.020") nominal
 - b. Fire Resistant Mineral Core: 3.0 mm (0.118 inch)
 - c. Back Face: 0.5mm (0.020") nominal
- F. Finishes
 - I. Pre-Weathered Finishes
 - a. elZinc® Graphite
 - b. elZinc® Slate
 - c. elZinc® Crystal
 - d. elZinc® Lave
 - e. elZinc® Oliva

2.03 ALTERNATES

- A. Base Bid/Contract Manufacturer: [Specify base bid/contract manufacturer].
 - 1. Product: [Specify product base bid/contract brand/trade name with product attributes and characteristics].
- B. Alternate No. [Specify #]: [Specify alternate manufacturer].
 - 2. Product: [Specify product alternate brand/trade name with product attributes and characteristics].
- C. Alternate No. [Specify #]: [Specify alternate manufacturer].
 - 3. Product: [Specify product alternate brand/trade name with product attributes and characteristics].

2.04 MCM PRODUCT PERFORMANCE

- A. Bond Integrity: Tested for resistance to delamination as follows:
 - 1. Peel Strength (ASTM D1781): 22.5 in-lb/in (100 N-m/m) minimum.
 - 2. No degradation in bond performance after 8 hours of submersion in boiling water at 212 degrees Fahrenheit, (100 degrees Celsius).
 - 3. No degradation in bond performance after and 21 days of immersion in water at 70 degrees Fahrenheit, (21 degrees Celsius).
 - 4. Thermally bonded to the fire-resistant core material in a continuous process under tension.
- B. Fire Performance: Flammability, Exterior, Non-load-bearing wall assemblies and panels, NFPA 285: Pass.
- C. Production Tolerances:
 - 1. Width: +/- 0.080in (2.0mm)
 - 2. Length: + 0.197in (5mm)
 - 3. Thickness
 - a. (4 mm Panel): +/- 0.008 inch (0.2 mm)
 - b. (6 mm Panel): +/- 0.012 inch (0.3mm)
 - 4. Bow: Maximum 0.2% length or width.
 - 5. Squareness: Maximum 0.157in (4mm)

2.05 FABRICATION

- A. General: Shop fabricate to sizes and joint configurations indicated on drawings.
 - 1. Fabricate panels too dimensions indicated on drawings based on an assumed design temperature of 70°F(21°C). Allow for ambient temperature range at time of fabrication.
 - 2. Formed MCM panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.
 - 3. Fabricate panels with sharply cut edges and no displacement of face sheet or protrusion of core.
- B. Fabrication Tolerances: Shop-fabricate panels to sizes and joint configurations indicated on drawings.
 - 1. Width: +/- 0.079 inch [+/- 2 mm] @ 70°F (21°C)
 - 2. Length: +/- 0.079 inch [+/- 2 mm] @ 70°F (21°C)
 - 3. Squareness: +/- 0.079 inch [+/- 2 mm] @ 70°F (21°C)

PART 3: EXECUTION

3.01 METAL PLANT FABRICATOR AND INSTALLER INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.02 EXAMINATION AND PREPARATION

- A. Verify that conditions of substrates previously installed under other sections or divisions are acceptable for metal plate panel rainscreen system installation. Documentation should be provided indicating any conditions detrimental to the performance or installation of the metal plate wall panel rainscreen system.
 - 1. Notify [Architect] of unacceptable conditions once discovered.
 - 2. Proceed with preparation and installation only after unacceptable conditions have been corrected.
- B. Field Measurements
 - 1. If required per project conditions, field measurements of the site condition are to be taken prior to beginning fabrication work and notification of any material modifications and resulting schedule adjustment shall be formally documented.
 - 2. Field measurements are to be made once all substrate and adjacent materials are installed, verifying the locations of wall framing members and wall opening dimensions before commencement of installation. Indicate measurements on the "As Built Shop Drawings".
- C. Project Schedule: Provisions in the project schedule must accommodate the time interval between field measurements and fabrication/installation.
- D. Miscellaneous Framing: Install miscellaneous MCM system support members and anchorage according to MCM System written instructions and drawings supplied by the MCM System Fabricator.

3.04 INSTALLATION

- A. General:
 - 1. Install panels plumb, level and true in compliance with fabricator's recommendations.
 - 2. Anchor panels securely in place in accordance with fabricator's approved shop drawings.
 - 3. Comply with fabricator's instructions for installation of concealed fasteners and with provisions of Section 07 90 00 for installation of joint sealers.
 - 4. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels: 0.25 inch in 20 feet (6.4 mm in 6.1 m), noncumulative.
 - 5. Separate contact of dissimilar metals with bituminous paint, approved plastic shims, or other approved methods as defined within the Aluminum Design Manual (ASD). Use gasketed or approved coated fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
- B. Related Products
 - 1. General: Refer to other related sections in Related Sections paragraph specified herein for related materials, including cold-form metal framing, flashing and trim, joint sealants, aluminum windows, glass and glazing and curtain walls.

3.05 FIELD QUALITY REQUIREMENTS

- A. Field Quality Control: Comply with panel system fabricator's recommendations and guidelines for field forming of panels.
- B. Field Quality Control: When required by contract, mock up shall be constructed and tested at the expense of the Architect/Owner/General Contractor.

- C. Testing Agency: If required, the Owner shall engage a qualified testing agency to perform tests and inspections.
- D. Fabricator's Field Services: Upon Owner's request, provide fabricator's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with fabricator's instructions.

3.06 ADJUSTING AND CLEANING

A. Adjusting

- 1. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement are the responsibility of the General Contractor.
- 2. Removal of panels damaged by other trades is the responsibility of the General Contractor.
- 3. Repair components of the MCM system that present with minor damage provided said repairs are not visibly apparent at a distance of 10ft (3m) from the surface at a 90° angle..
- 4. Remove and replace components of the MCM system damaged beyond repair.
- 5. Remove protective film immediately after installation of MCM and immediately prior to completion of the MCM system work. Protective film intentionally left in place after panel installation on any elevation at the direction of the General Contractor, is the responsibility of the General Contractor.
- 6. Any additional protection, after installation, is the responsibility of the General Contractor.
- 7. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- 8. Promptly remove from the jobsite any damaged MCM panels, protective film, and other debris attributable to MCM system and installation, and legally dispose of said materials.

B. Cleaning

- 1. After MCM system installation remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3.07 PROTECTION

- A. Protect installed products from damage during subsequent construction work until final inspection and acceptance by Owner.

B. [____]

END OF SECTION