SECTION 07410

PREFINISHED INSULATED METAL PANEL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Description: Provide and install all steel faced, factory foamed and assembled, flat faced insulated panel units for the exterior walls, soffits and fascias, complete with periphery trim as shown on Contract Drawings and specified in this Section.

1. Drawing designation "**Metal Wall Panel System B**".
2. Include adjustable structural tube support assemblies, complete with attachments to building structure.
3. Exposed wet sealants, tape, or battens are not permitted.
4. Include integrated window design compatible with the panel joinery and secondary support system

B. Related Sections:

1. Section 03300 – Cast-in-Place Concrete
2. Section 05120 - Structural Steel
3. Section 07412 - Metal Wall Panels
4. Section 07415 - Composite Metal Panel System
5. Section 07620 - Sheet Metal Flashing and Trim
6. Section 08800 – Glazing: Glass and glazing related to the window system.
7. All glass curtain wall areas.

1.2 SYSTEM DESCRIPTION

A. System Includes:

1. Steel faced factory foamed in-place wall panel units with integral reveals and profiled panels with universal joinery for use in either vertical or horizontal orientations.
2. Integrated window system with thermal barrier. Metal Panel System Contractor shall be responsible for fully integrated waterproof, weathertight system.
3. Extruded aluminum and break metal trim related to the wall and window system and its intersection with adjacent materials.
4. Sealants and gasketing between panels, windows, and other materials and their intersections.
5. Neoprene blocking at reveals and joints as shown on Drawings.
6. Metal siding secondary supports as shown on Drawings. Support members shall comply with PERFORMANCE REQUIREMENTS.
7. Adjustable secondary supports for the wall and window system specified in PERFORMANCE REQUIREMENTS.
8. Design, provide, and coordinate installation of embedment plates in concrete structure.
9. Cap flashing at parapets

1.3 SUBMITTALS

A. **Project Listings:** Submit listing of at least five (5) projects similar in type, size and complexity, complete in the past ten years. Include names and phone numbers for representatives of the Owner, Architect, and Contractor for each of the projects.

B. **Letter** from the proposed manufacturer confirming that the proposed Installer is an acceptable Contractor at the highest level, authorized to install the proposed system.

C. **Samples:** Colors to match Architect's samples

1. Submit two 24" x 24" samples of each color of the composite facing panel.
2. Submit two samples of each color and finish, at least 3" x 5".
3. Submit a sample of the wall cladding system, at least 24" x 24", made up of four (4) individual panels, complete with shop applied edge treatment, showing the following:
   a. Attachment members, stiffeners, joinery, anchorage, expansion provisions, profiles, panel to panel joint, and four way intersection.

D. **Shop And Erection Drawings:** Submit shop drawings with elevations of all cladding areas at 1/8" scale, optionally with typical elevations at ½" scale, and details at 3" or greater scale, to show dimensioning, member profiles, anchorage systems, interface with all applicable building construction elements, adhesive, sealants, and interface with glazing. Indicate the section moduli of wind-load-bearing members, and illustrate worst case deflection calculations for the required design loads.

1. Erection procedures will be included where required to clearly explain proper installation of fasteners, trim, gaskets, and sealants.
2. Calculations supporting structural performance shall be prepared and drawings stamped by a Professional Engineer in the state of Louisiana.
3. Materials and finish for each component shall be defined.

E. **Product Data:** Submit manufacturer's specifications for material and fabrication of cladding and support /attachment systems, including instructions and recommendations for installation and maintenance. Include manufacturer's product data for paint, gaskets, sealants, backer rod, adhesive, and other materials. Include certified test reports showing compliance with requirements where a test method is indicated.

F. **Design Calculations:** Submit design calculations with a Structural Engineer's stamp and signature to confirm compliance with structural criteria stated herein and /or required by applicable codes. Engineer must be registered in the state of Louisiana.

G. **Submit test reports and certifications** to demonstrate compliance with performance requirements and building code acceptance specified.

H. **Samples** shall be submitted to illustrate the panel design, texture, color and other features specified.

1.4 QUALITY ASSURANCE

A. **Building Code Compliance:** Wall panel system shall comply with requirements for foam plastics and finished panel performance as established by the applicable building code for use where non-load bearing, non-combustible wall construction is permitted. Laboratory and full scale testing including, but not limited to the following shall be available. (Note: Tests of building units shall be conducted with the joinery, sealant, clips and fastening intended for the project.)

1. Foam core and interior surface of the complete panel system shall demonstrate compliance with the following criteria for surface burning characteristics per UL Standard 723 (ASTM E84).

   Flame Spread – 25 or less
   Smoke Developed – 450 or less
2. Classified as Building Units for Interior Building Construction per UL Standard 1715.
3. Classified as a component of fire rated non- load bearing wall assemblies per UL Standard 263.
4. Approved per FM Standard 4880 as a Class 1 insulated wall and/or ceiling panel.
5. Evaluated per UBC 26-9 Intermediate Scale Fire Test for flammability characteristics of exterior non-load bearing wall panel assemblies.
6. Ignition temperature of the foam plastic core shall have been established per ASTM D1929.
7. Panels shall be approved for use without the requirement of a thermal barrier or automatic sprinkler.

B. Manufacturer's Qualifications: The manufacturer shall have had a minimum of ten (10) years experience in the successful completion of projects employing similar materials, applications, and performance requirements.

1. Manufacturer shall provide a list of five (5) similar completed projects with addresses of the project location, architect, and owner.

C. Installer's Qualifications: The Installer shall have had a minimum of ten (10) years experience in the successful completion of projects employing similar materials, applications, and performance requirements.

1. Installer shall be certified by the manufacturer for proficiency in erecting the specified products.
2. The wall systems contractor shall provide a list of five (5) similar completed projects with addresses of the project location, architect, and owner.
3. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified structural engineer licensed in the state of Louisiana.

D. Field Water Test: Perform testing in accordance with AAMA 501.2 "Field Check for Water Leakage" on a completed portion of the installation at the Architect's direction. In the event that such testing should result in uncontrolled leakage, eliminate the causes of such leakage at no additional cost. Remedial measures must maintain standards of quality and durability and are subject to approval.

1. Perform three water tests, 1 test at 40% completion and 1 test at 80% completion and 1 test at 100% completion.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to prefinished insulated metal panel assemblies including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, prefinished insulated metal panel Installer, prefinished insulated metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects prefinished insulated metal panels including installers of doors and windows.
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 prefinished insulated metal panel installation, including manufacturer'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 prefinished insulated metal panels.
6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
7. Review temporary protection requirements for prefinished insulated metal panel assembly during and after installation.
8. Review wall panel observation and repair procedures after prefinished insulated metal panel installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.5 SUBSTITUTIONS

A. **Materials, accessories and testing** specified shall establish the minimum level of quality, performance, dimension and appearance required of any substitution.

B. **No substitution** will be considered unless written request for approval has been received by the specifying architect at least seven days prior to the established bid date. Evidence shall be submitted to demonstrate equivalency to the products and performance levels specified.

1. A complete description of the substitution including details referenced to the wall and window conditions shown on the contract drawings.
2. Independent test reports verifying compliance with specified performance requirements.
3. A detailed listing of each specification item with which the substitution does not fully comply.

C. **Laminated panels** shall not be considered acceptable substitutes for the specified foamed in-place panels.

D. **The manufacturer** or wall systems contractor proposing the substitute shall pay the costs of any other subcontractor affected by the proposed substitute.

1.6 PERFORMANCE REQUIREMENTS

A. **Panels, windows and secondary support systems** shall be designed for component and cladding wind loads determined in accordance with the International Building Code, 2003 Edition, and the referenced standard ASCE 7-02 for the parameters specified.

1. Basic wind gust - V = 130 mph.
2. Importance factor - = Category 2.
3. Exposure - B.
4. Missile Impact Ratings:
    a. Large Missile Impact (LMI) - from elevation 0 to 30 feet
    b. Small Missile Impact (SMI) - from elevation 30 to 60 feet.
    c. Not Impact Resistant (NIR): above elevation 60 feet.

B. **Secondary supports** for the window and wall system shall be designed in accordance with AISC or Aluminum Association design procedures. Through-tube support systems

shall be designed and installed only by the manufacturer and certified wall systems contractor.

1. Secondary supports shall not vary from the theoretical plane by more than the specified tolerances. (Note: These are more stringent than AISC or ACI tolerances to ensure optimal appearance and performance of the wall system.)
   a. ¼ inch in any 20-foot length vertically or horizontally.
   b. ½ inch in any building elevation.
   c. 1/8 inch within 5 feet of any change in plane such as corners and soffits.

C. **The wall and window** system or secondary supports shall be designed to allow differential movement of the buildings roof and floor structures. (Note: Movement of roof and/or floor systems exceeding ¼" shall require the use of thru tube supports with sliding connections.)

D. **Performance** of the wall and window system shall be verifiable with tests witnessed or conducted by independent agencies.

1. Structural performance of the wall panels shall be derived from ASTM E72 Chamber Method with a deflection limit of l/180 applied to positive load. Ultimate structural values shall be achieved without the use of backside mechanical attachments to the structure.
2. There shall be no evidence of delamination of the wall panels after two million cycles of positive and negative L/180 deflection.
3. Limit mullion deflection to 1/175; with full recovery of glazing materials
4. Thermal performance of the wall panels shall be based on tests in accordance with ASTM C236 corrected to 15 mph outside and still air inside. Tests shall include side-joint, standard fastening and integral reveals or profiling.
   a. R value for 2" flat panel shall be 14
5. Air infiltration of the wall panels and windows shall not exceed .06 CFM/Ft^2 at a static pressure of 6.24 PSF when tested in accordance with ASTM E283.
6. There shall be no uncontrolled water penetration through the panel joints and integrated window or sunscreen components at 12 PSF when tested in accordance with ASTM E331.
7. The standard horizontal panel joint shall demonstrate effective pressure equalization principles with liner seals broken at a static pressure of 12 PSF when tested in accordance with ASTM E331.
8. Expansion and Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 100 degrees F over a 12 hour period without causing detrimental effects to system components.
9. Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
10. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

E. **Compatibility:** The Prefinished Insulated Metal Panel System Contractor is responsible for the design and the construction of the Prefinished Insulated Metal Panel system to be compatible with the main building structure with regard to stresses, deflections, thermal movements and other factors pertinent to the design and the integrity of the Prefinished Insulated Metal Panel system.

1.7 FINISH PERFORMANCE

A. **General:** Provide certified test results by a recognized testing laboratory or agency in accordance with specified test methods.

1.8 BUILDING CODE ACCEPTANCE

A. **Wall panel system** shall comply with requirements for foam plastics and finished panel performance as established by the applicable building code for use where non-load bearing, non-combustible wall construction is permitted. Laboratory and full scale testing including, but not limited to the following shall be available. (Note: Tests of building units shall be conducted with the joinery, sealant, clips and fastening intended for the project.)

1. Foam core and interior surface of the complete panel system shall demonstrate compliance with the following criteria for surface burning characteristics per UL Standard 723 (ASTM E84).

   Flame Spread – 25 or less
   Smoke Developed – 450 or less
2. Classified as Building Units for Interior Building Construction per UL Standard 1715.
3. Classified as a component of fire rated non- load bearing wall assemblies per UL Standard 263.
4. Approved per FM Standard 4880 as a Class 1 insulated wall and/or ceiling panel.
5. Evaluated per UBC 26-9 Intermediate Scale Fire Test for flammability characteristics of exterior non-load bearing wall panel assemblies.
6. Ignition temperature of the foam plastic core shall have been established per ASTM D1929.
7. Panels shall be approved for use without the requirement of a thermal barrier or automatic sprinkler.

1.9 DELIVERY, STORAGE, AND HANDLING

A. **Deliver components,** sheets, prefinished insulated metal panels, and other manufactured items so as not to be damaged or deformed. Package prefinished insulated metal panels for protection during transportation and handling.

B. **Unload, store, and erect** prefinished insulated metal panels in a manner to prevent bending, warping, twisting, and surface damage.

1. Materials shall be unloaded and stored per the manufacturer's instructions to prevent damage due to handling and weather.

C. **Stack** prefinished insulated metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store prefinished insulated metal panels to ensure dryness, with positive slope for drainage of water. Do not store prefinished insulated metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. **Protect** strippable protective covering on prefinished insulated metal panels from exposure to sunlight and high humidity, except to extent necessary for period of prefinished insulated metal panel installation.

1.10 PROJECT CONDITIONS

A. **Weather Limitations:** Proceed with installation only when existing and forecasted weather conditions permit assembly of prefinished insulated metal panels to be

performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before prefinished insulated metal panel fabrication and indicate measurements on Shop Drawings.

1.11 COORDINATION

A. Coordinate prefinished insulated metal panel assemblies with rain drainage work, flashing, trim, and construction of studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.12 WARRANTY

A. General: The specified warranties shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents

B. Warranty: Furnish written warranty signed jointly by the Manufacturer and Fabricator / Installer and the Contractor, agreeing to replace without cost to the Owner workmanship and materials which are discovered to have defects (including but not limited to leaks and failure to withstand specified wind conditions) within the 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: 5 years after the date of Substantial Completion

C. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace prefinished insulated metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. High-Performance Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
   a. Falling below minimum standards defined in FINISH PERFORMANCE
   b. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturers/Products: Approved manufacturers and products provided the following can meet or exceed all specified criteria and provide the type, finish and style specified:

1. CENTRIA, “Dimension Series”.
2. Metl-Span ”CF Architectural Wall Panel”.

B. Other Manufacturers: Products of other manufacturers require pre-bid approval in accordance with the Instructions to Bidders.

C. Finishes/Colors: Schedule follows end of text.

2.2 PREFINISHED INSULATED METAL PANELS

A. Flat Panels With Integral Reveals:

1. 2 inches thick.
2. Approximately 20-½ inch vertical dimension.
3. Approximately 4'-9 ½" horizontal dimension
4. Reveal width for horizontal panels is 1 inch.
5. The face of the panel shall be non-directionally embossed.
6. The liner of the panel shall be non-directionally embossed and planked.

B. Joinery for Flat Panels:

1. Universal double tongue and groove joint that can be used vertically and horizontally and can join any combination of flat and profiled panel units.
2. Adjustable plus 1/16-inch to minus 1/8-inch from the specified panel module.
3. Horizontal joints shall have a positive drip edge, sloped drain shelf and integral venting to the exterior where required along the panel length and a 2-3/8-inch gutter interlock to provide effective pressure equalized performance as demonstrated by testing specified in 1.6.D.
4. Joinery shall be designed to prevent entrapment of moisture that may be present during the construction process.

C. Trimless ends where used shall be integral to the panel face or tabbed and effectively sealed to the panel face with no edges exposed to view.

D. Panels shall be factory foamed in-place so that no internal voids exist that could trap moisture or condensation and so that the initial insulating integrity of the foam core is preserved by the impermeable steel skins.

E. All panel skins shall be roll formed to insure consistency of shape and joinery.

F. Panel attachment clips shall be designed to prevent crushing of the foam core during fastening and shall mechanically engage both face and liner elements to the panel supports.

G. The modified polyisocyanurate foam core shall have a minimum density of 2.7 PCF and minimum tensile and compressive strength of 20 PSI.

2.3 INTEGRATED WINDOW DESIGN

A. Windows shall be designed for fixed glazing, include a thermal barrier and be designed to be fully compatible with the panel joinery and secondary support system.

1. Head and sill shall be designed to achieve the same pressure equalization performance as the horizontal panel system.
2. Minimum extrusion thickness shall be 1/16 inch for trim, stops and appendages and 3/32 inch for structural components.
3. Design shall provide for cladding of any secondary structural elements that pass through the window area.
4. Where required, the window system shall allow up to ¼ inch of differential floor movement.
5. Glazing gaskets, sealants, fasteners, setting and splice blocks shall be included as required for a complete window system.
6. Units shall be re-glazeable without dismantling the system.

7. Head, sill and jamb extrusion shall be one piece, maintain the liner sealant plane and be installed without the use of exposed wet seals.
8. Head, sill and jamb extrusions shall be thermally broken or isolated from concealed and exposed interior surfaces. Where extrusions are not so designed, provision shall be made for directing condensation to the exterior.

2.4 TRIM

A. **Extruded trim** shall be furnished by the manufacturer. Installation shall be by the certified wall systems contractor except for those that require completion of work by other trades.

2.5 FABRICATION

A. **The wall and window** components shall be prefabricated for field assembly in accordance with the procedures and details shown on the shop drawings.

B. **The wall panels** shall be fabricated in accordance with the quality procedures established for the specified UL classifications, FM and building code approvals.

2.6 MATERIALS

A. **Panels:**
1. Exterior skin of the flat panels with integral reveals shall be ASTM A653, grade 37, 22 gauge G90 galvanized steel.
2. Interior skin for all panels shall be ASTM A653, grade 37, 26 gauge G90 galvanized steel.

B. **Fully Integrated Windows:**
1. Extrusion material shall be 6063 – T5 aluminum.
2. All exposed extrusion areas shall be finished.
   a. Exterior shall be finished with PVDF color and identical finish to match adjacent panel skins.
   b. Interior shall be finished with PVDF colors as selected by Architect from manufacturer’s full range of colors.

C. **Trim:**
1. Extrusion material shall be 6063 – T5 aluminum, break metal trim to be minimum 20 gage with gage increases to prevent oil canning for flat areas exceeding 6 inches.
2. All exposed areas shall be finished with identical PVDF color and identical finish matching adjacent metal panels.

2.7 FINISHES

A. **Finishes, General:**
1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
2. Protect mechanical and painted finishes on exposed surfaces from damage by applying a 2-1/2 mil strippable, temporary protective covering before shipping.
3. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations

in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Exposed Embossed Panel Finish:

1. High-Performance PVDF Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2604 and with coating and resin manufacturers' written instructions.
2. Coating Thickness: 1.6 mils.
3. Color and Gloss: As selected by Architect from Manufacturer's standard colors.

C. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.6 mil.

2.8 MISCELLANEOUS MATERIALS

A. Fasteners: All fasteners shall be stainless steel.

1. Self-drilling or self-tapping 410 stainless steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal panels.
2. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, prefinished insulated metal panel supports, and other conditions affecting performance of work.

1. Contractor shall check the alignment of the structural supports. Alignment exceeding tolerances defined in the AISC Code of Standard Practice shall be corrected prior to proceeding with the installation of the wall panel system
2. 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 prefinished insulated metal panel manufacturer.
3. Examine sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by prefinished insulated metal panel manufacturer.

B. Examine roughing-in for components and systems penetrating prefinished insulated metal panels to verify actual locations of penetrations relative to seam locations of prefinished insulated metal panels before prefinished insulated metal panel installation.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

C. All materials shall be inspected for damage and conformance to the specifications and shop drawings prior to installation.

3.2 INSTALLATION

A. **Manufacturer** shall provide detailed instructions covering the tools, fasteners, sealants, gaskets, and procedures required to assure performance of the wall and window assembly as specified.

B. **Install** the wall and window systems, fasteners, trim and related items in accordance with dimensions and procedures shown on the approved shop and erection drawings.

C. **Sealants and gaskets** shall be installed where shown and in accordance with the approved shop and erection drawings to assure air and water infiltration performance specified.

D. **Windows** shall be glazed in accordance with the approved shop and erection drawings and the Flat Glass Manufacturers Association standards.

E. **Paint**, bituminous coating, or sealant as recommended by the manufacturer shall separate dissimilar metals .

F. **Work** shall be coordinated with other trades as required to insure proper flashing and seals to intersecting construction.

3.3 DAMAGED MATERIAL

A. **Damage** caused by the manufacturer or contractor shall be replaced or repaired to as new condition as determined by Architect.

B. **The Contractor** shall inspect each completed wall and window area and shall protect completed work from damage by other trades.

3.4 CLEANING

A. **The Contractor** shall remove all protective materials and labels from the wall and window system as the system is erected in accordance with the manufacturers instructions.

B. **The Contractor** shall perform final cleaning of the wall and window system due to conditions that occur after wall system has been completed. Cleaning is to be done in accordance with the manufacturer’s instructions.

END OF SECTION