SECTION 07415

COMPOSITE METAL PANEL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Description: All composite metal cladding indicated on the drawings as **"Metal Wall Panel System-C."**

B. Related Sections:

1. Section 05400 - Cold formed Metal Framing
2. Section 07272 - Vapor Permeable, Fluid-Applied Membrane Air Barriers: Weather-resistant barrier installed over sheathing.
3. Section 07410 - Prefinished Insulated Metal Panel System
4. Section 07412 - Metal Wall Panels
5. Section 07620 - Sheet Metal Flashing and Trim
6. Section 07920 - Sealants
7. Section 08800 - Glass and Glazing
8. Section 09255 - Exterior Sheathing

1.2 SYSTEM DESCRIPTION

A. The work of this section includes design, engineering, fabrication, installation and testing of the various aluminum cladding assemblies to certify compliance with all applicable quality and performance requirements.

B. Composite Metal Panel System Contractor shall provide all labor, materials, equipment, and services to perform all operations necessary for a complete installation in accordance with the requirements and intent of this section.

1. Composite Metal Panel System Contractor shall coordinate with Cold-Formed Metal Framing contractor in order to provide a complete installation.

C. The Drawings are diagrammatic, and neither indicate the intricacies of the specified systems nor identify and/or solve problems of thermal or structural movement and deflection, wind loads, air and water infiltration, and moisture disposal.

D. The primary components of the Composite Metal Panel system are:

1. Aluminum faced composite panels.
2. Panel support and mounting components which include but are not limited to aluminum extrusions, plates, angles, stiffeners, anchorages, shims, furring, fasteners, gaskets, adhesive and sealants, related flashing, receivers, adapters, and maskings for complete installation.
3. Parapet coping, soffits, sills, border and filler items as indicated and integral components of the panel system or as designed

E. Composite Metal Panel System Contractor shall coordinate attachment of Composite Metal Panel System with Insulated Metal Panel system.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Testing: Where the cladding systems and components have been tested in accordance with the tests specified under this Article, provide certification by independent laboratory showing compliance with requirements. Otherwise, perform tests through an approved laboratory and provide certified test results showing compliance with requirements. Panel system must show testing and approval prior to bid date.

B. Performance Requirements:

1. 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 and the following criteria:
   a. Basic wind gust - V = 130 mph.
   b. Importance factor - = Category 2.
   c. Exposure - B.
2. 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.

C. Deflections and Thermal Movements: Provide products and systems which are capable of withstanding building movements and weather exposures, including wind loading and which are capable of performing within the following limitations:

1. Normal to the Plane of the Wall: The maximum deflection of panel perimeter and aluminum framing members shall be L/175. The maximum allowable deflection for the aluminum composite panel material only is L/60.
2. Thermal Movements: Make allowances for free vertical and horizontal movement due to the contraction and expansion for cladding component parts due to seasonal variations in temperature.

D. Leakage Resistance, Water and Air (rainscreen system): Provide products and systems that have been tested to demonstrate permanent resistance to leakage as follows:

1. Air Infiltration: Tested in accordance with ASTM E-283, with a static air pressure differential of 6.24 psf, the air infiltration rate shall not exceed 0.06 cfm per square foot of fixed wall area.
2. Water Penetration: Water penetration in the specification is defined as the appearance of uncontrolled water within the wall construction. Provision shall be made in the design to drain to the exterior face of the wall any leakage of water occurring at joints and /or condensation taking place within the wall construction. Tested in accordance with ASTM E-331, no water infiltration at a static pressure of 15.0 psf, after 15 minutes.
3. Air and Moisture /Vapor Barrier: An air and moisture/vapor barrier, Section 0272, and exterior sheathing substrate, Section 09255, is required for weatherproof system performance. These materials are not part of the panel Fabricator /installer scope of work and must be applied prior to the

E. Structural Performance: Shall be tested in accordance with ASTM E-330 at design pressure. No permanent deformation or failures of structural members shall occur.

1. Design and fabricate the cladding systems per local building code requirements or ASCE-7-99 which ever is greater.
2. The system shall not constrict expansion and contraction by means of devices or attachments that when installed to panel edges, "lock down" panels and compensate for movement by allowing " crowning" or "pillowing" of panel face.

F. Fire Performance Characteristics:

1. Panel Fire Performance:
   a. ASTM E-84, Flame Spread 5, Smoke Density 5.

G. Panel Flatness Criteria:

1. Flat panels: Maximum 1/32" in 2' - 0" on panel in any direction for assembled units (non-accumulative).

H. Compatibility: The Composite Metal Panel System Contractor is responsible for the design and construction of the Composite building 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 Composite building Panel system.

1. Composite Metal Panel System Contractor shall coordinate with design and construction of Cold-Formed Metal Framing.
2. Composite Metal Panel System Contractor shall coordinate attachment of composite metal panel system with insulated metal panels.

1.4 FINISH PERFORMANCE

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

1.5 SUBMITTALS

A. Comply with requirements of Section 01330 and this section.

B. 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.

C. Samples:

1. Submit two 24" x 24" samples of the composite facing panel.
2. Submit two samples of each color and finish, at least 3" x 5".

D. Shop Drawings: Submit shop drawings with elevations of all cladding areas at 1/8" scale, with typical elevations at ½" scale, and details at 3" or greater scale, to show dimensioning, complete panel and jointing layout, 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.

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 performance requirements and structural criteria stated herein and /or required by applicable codes. Engineer must be registered in the state of Louisiana.

1.6 QUALITY ASSURANCE

A. For the purpose of establishing the level of quality, performance and appearance required, the plans, elevations, details and specifications are based on specific cladding system(s) utilizing aluminum composite panel material facing. In addition to conforming to the sizes and configurations shown on the drawings, cladding systems shall incorporate the following design characteristics:

1. Dry joint, pressure equalized system with joints of indicated widths. Wet seal or exposed gasket systems are not considered equal.
2. Continuous aluminum perimeter reinforcing extrusions.
3. System design must provide sufficient support and stiffening to prevent oil-canning, dimpling, buckling, crimping along radius edges and other surface irregularities.
4. Installations must not have visible fasteners in the reveal strip or telegraphing of fastening. Mounting assemblies on the cladding faces or any other compromise of a neat, smooth, flat, fastener free appearance will not be acceptable.
5. No field fabrication of panel or panel attachment system or a combination of the panel and system shall be allowed. Jobsite folding of panel returns are not acceptable.

B. Substitutions: In accordance with Section 01630. Submissions of other systems must include the following:

1. Panel material specifications and samples.
2. Details of typical edge conditions, corners, joints, 4-way intersections, and abutments to similar materials.
3. A 24" x 24" sample fabricated panel with perimeter extrusions and one stiffener.
4. Two 12" long samples of all extrusions required for the system.
5. BOCA Research Report for system using aluminum composite panel material facing
6. Documentation certifying that the panel material and finish meet or exceed the requirements of article 2.1.A of this specification.
7. Independent laboratory test results certifying that the proposed system meets or exceeds the System Performance Requirements stated in article 1.3 of this specification.

C. Manufacturer's Qualifications: The manufacturers of the composite facing panel must have at least ten (10) years experience in the manufacture of the specified composite panel. Manufacturers of the trim and other accessory products must have at least five- (5) years experience in the manufacture of their respective products.

D. Fabricator /Installer Qualifications: The Fabricator /Installer must have at least ten (10) years experience installing light gauge metal framing and erecting aluminum composite panel systems. The Fabricator /Installer must have successfully completed

at least five (5) projects of similar magnitude and scope utilizing the specified panel system

1. Fabricator and installer for composite building panel system as described in this section shall have successfully fabricated and installed panels with similar radius defined arc utilizing the same system as described herein. Architect shall determine success of fabrication and installation.

E. 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.

F. Field Measurements: Verify actual field dimensions in construction work by accurate field measurement before fabrication, and show recorded measurements on final shop drawings. Where field measurement is not possible, either the General Contractor or Construction Manager will provide guaranteed dimensions including steel framing, openings, and other pertinent interfacing items, to allow fabrication to proceed.

G. Conflicts in Requirements: If conflicts exist on the drawings, in this specification, or between the drawing and specifications, the more stringent requirement shall apply.

1.7 WARRANTY

A. 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. Defective is defined to include, but not limited to the following:
   a. Abnormal aging.
   b. Abnormal weathering.
   c. Deterioration or discoloration of finishes.
   d. Failure of the system to meet specified performance requirements.
2. Warranty period: 5 years after the date of Substantial Completion

B. 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.

1.8 DELIVERY, STORAGE AND HANDLING

A. Protect finish and edges in accordance with panel manufacturer's recommendations. Protect panels with removable plastic film applied prior to fabrication, remaining on during fabrication, shipping and installation.

B. Store material in accordance with panel manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. Aluminum Cladding Facing Material:

1. Product:

   Centria Formabond
   Alucobond Plus aluminum composite material as manufactured by Alcan Composites USA, Inc., Benton, Kentucky or approved equal.
   Reynobond FR as manufactured by Alcoa Cladding Systems, Eastman, GA.
   Alpolic FR as manufactured by Mitsubishi Chemical America, Inc.
2. Core: Thermoplastic fire core material, which in the composite assembly, meets performance characteristics, specified and code requirements as set forth in the BOCA Basic /National Building Code and U. L. for Class A construction.
3. Face Sheets: 0.020" (minimum) aluminum 3000 series alloy, coil coated with the specified high performance finish, and bonded in a continuous process to core material to meet performance requirements.
4. Thickness: 4mm
5. Bond Integrity: When tested in accordance with ASTM D1781-93 for bond integrity, simulating resistance to delamination:

   a. Peel Strength: 115 Nmm /mm.
6. Finish: 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.

   a. Coating Thickness: 1.6 mils.

   b. Color and Gloss: As selected by Architect from Manufacturer's standard colors

B. Cladding Panel Mounting System: Provide all necessary members required to install cladding such as extrusion formed members, sheet, plate and angles, of the alloy, temper and thickness as engineered by the fabricator and approved by the manufacturer for the various project installation conditions and to comply with the requirements of ASTM B-209 for sheet or plate.

C. Stiffeners: Extruded aluminum sections secured to edge trim bonded and structurally fastened to rear face of composite panel with structural silicone adhesive, of sufficient number, size and strength to maintain flatness of the cladding within the specified tolerances.

D. Sealant Systems: Concealed sealants and gaskets within the system shall be premium grade products in accordance with the manufacturer's standards to meet performance requirements, and as approved by the Architect. Exposed Sealant to be Dow 795, or G. E. Silprof silicone in color as selected by the Architect.

E. Flashings: Fabricate flashing from .062" minimum thickness aluminum sheet. Where exposed to view, finish the same as the cladding. Provide lap strip under flashing at abutted conditions with lapped surface sealed with a full bead of approved non-hardening sealant.

F. Fasteners: Non-magnetic stainless steel, warranted by manufacturer to be non-corrosive and compatible with aluminum framing members, trim anchors, and other components of the building assembly to receive fasteners. Do not expose fasteners except where unavoidable. When exposed fasteners are allowed by the Architect, they shall be stainless steel with heads matching color of metal panels by means of plastic caps or factory-applied coating.

G. Anchors, Clips, and Accessories: Depending on strength and corrosion-inhibiting requirement, fabricate units of aluminum, non-magnetic stainless steel, or hot-dip zinc coated steel or iron.

H. Adhesive: Shall be a premium quality structural silicone adhesive as recommended by the face panel manufacturer and approved by the Architect.

2.2 PANEL FABRICATION

A. General:

1. Fabricate cladding systems to the dimensions, sizes and profiles indicated on the Drawings, based on an assumed design temperature of 70^0 F. Allow for ambient temperature range at time of fabrication and erection.
2. Coordinate fabrication schedule with construction progress as directed by the General Contractor or Construction Manager to avoid delay of work.
3. Shop fabricate units to the greatest extent practical, ready for erection. If not shop assemble, prefabricate components at the shop as required for proper and expeditious field assembly. Mark components to correspond with those on the approved shop drawings.
4. Design, fabricate, assemble, and erect systems, to be free of uncontrolled water penetration. Provide means of concealed drainage with baffles and weeps for water condensation, which may accumulate in the various cladding systems.

B. Composite Facing Panels and Mounting Systems:

1. Fabricate cladding panels to the sizes and configurations shown using composite panel facing material and continuous perimeter reinforcing extrusions in a rout and return edge configuration. "Continuous Edge Grip" systems are acceptable.
2. Joint filler strips to be fitted into extrusion pockets of adjacent panels and must be fabricated from the same material as the adjoining panels.
3. No caulking shall be permitted in the panel to panel joints of this system except where shown on Drawings.
4. The installation methods shall be such that the cladding systems shall remain within deflection limitations, and return to designed shape, regardless of temperature changes and design wind loads.
5. Provide required stiffeners secured to the rear face of the facing panels with structural silicone and mechanically retained by the edge trim members.
6. Maximum allowable panel bow of fabricated panels shall be 0.8% of panel dimension in width and length.
7. Panel lines, breaks, and angles shall be sharp and true, with surfaces free of warp, buckle, oil-canning, crimping and other defects.
8. Approved Fabricators provided the following can meet or exceed all specified criteria and provide the type, finish and style specified:

a. Centria

b. John W. McDougall Co., Inc.
3731 Amy Lynn Drive
Nashville, TN 37218
Phone: 615-321-3900; Fax: 615-329-9069

c. Thermal Systems of Calgary, Canada

d. Prior approved equal

9. Substitute panel fabricators must obtain approval from architect 7 days prior to scheduled bid date. The architect will consider substitutions for the product specified only if performance properties, in the Architect's opinion, equal or exceed that which has been specified herein.

2.3 ACCESSORIES

A. **Break metal trim** to match panel skin exteriors to be furnished at copings areas across entire structure.

1. Coping shall have integral internal stiffeners.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine supporting structure and conditions under which the work is to be erected and notify the General Contractor or Construction Manager in writing of conditions detrimental to the proper and timely completion of the work. Unless directed in writing, do not proceed with erection until unsatisfactory conditions have been corrected. Tolerance for substructure shall be = /- ¼".

B. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to this work.

3.2 INSTALLATION

A. Erect panels plumb, level, and true to within a tolerance of 1/8" in 12'-0" and ¼" in 20'-0" non-cumulative.

B. Anchor component parts of the systems securely in place in accordance with approved shop drawings, providing for necessary thermal and structural movement.

C. Separate dissimilar metals per method shown on the approved shop drawings.

D. Do not cut, trim, weld, or braze component parts during erection in a manner, which would damage the finish, decrease the strength, or result in a visual imperfection or a failure in performance.

E. Copings shall have fasteners at 12" O.C. maximum.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged panels (as designated by Architect).

B. Repair panels with minor damage.

C. Protective plastic coating shall be removed after erection and prior applying sealant. Removal of the protective coating will provide a clean panel surface.

D. All panel surfaces shall be clean at Substantial Completion.

END OF SECTION