SECTION 07412 - METAL WALL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. All engineering, manufacturing and installation of the items listed by a single manufacturer and wall systems contractor trained, tested and, certified by the manufacturer for proficiency in erecting the specified products.

1. Steel faced factory foamed in-place flat panels with integral reveals and profiled panels with compatible joinery. Panels shall be designed to permit installation in horizontal orientations.
2. Integrated Louvers for horizontally oriented panels.
3. Extruded aluminum trim related to the wall system and its intersection with adjacent materials.
4. Sealants and gasketing between panels and their intersections.
5. Adjustable secondary supports for the panel system specified in 1.04, B.

B. Related Sections:

1. Secondary support system for the panel system. (Ref. 1.04.B)
2. Louvers where specified shall be integrated with the panel joinery. (Ref. 2.03).

1.2 QUALITY ASSURANCE

A. CENTRIA, 1005 Beaver Grade Road, Moon Township, PA 15108 products and services shall establish the minimum level of quality, performance, dimension and appearance required.

B. Manufacturer and wall systems contractor shall demonstrate a minimum of ten years of experience in the successful completion of projects employing similar materials, applications and performance requirements.

C. Manufacturer and wall systems contractor shall provide a list of five similar completed projects with addresses of the location, architect and owner.

1.3 SUBSTITUTIONS

A. Materials, accessories and testing specified shall establish the minimum level of quality, performance, dimension and appearance required of any substitution. (Note: Formawall Dimension Series incorporates foamed-in- place construction with a pressure equalization chamber vented along the panel length providing true curtain wall performance. Only fabricated

thin composites with comparable joinery, equivalent insulation and a separate vapor barrier can be considered "as equal".)

B. No substitution will be considered unless a written request to the specifying architect is received for approval at least ten days prior to the established bid date. Evidence shall be submitted to demonstrate equivalency to the products and performance levels specified. Laminated panels shall not be considered acceptable substitutes for the specified foamed in-place panels.

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

1.4 PERFORMANCE REQUIREMENTS

A. Panels and secondary support systems shall be designed for component and cladding wind loads determined in accordance with the more stringent of the local building code or ASCE 7-98 for the parameters specified and indicated on the drawings.

B. Secondary supports for the panel system shall be designed in accordance with AISC 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 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 maximum in any building elevation.
c. ± 1/8 inch within 5 feet of any change in plane such as corners and soffits.

C. The panel 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 inch shall require the use of thru tube supports with sliding connections.)

D. Performance of the wall panel 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. Thermal performance of the wall panels shall be based on tests in accordance with ASTM C1363 corrected to 15 mph outside and still air inside. Tests shall include 3 side-joints, in a mock-up assembly approx. 5'-0 X 5'-0 in size, standard fastening and integral reveals or profiling. Where reveals exceed the standards the manufacturer shall provide similar testing to document any adjustments required to the standard conditions.

   a. ***Tested R value is 20***.

3. Air filtration of the wall panels shall not exceed .06 CFM/Ft² at a static pressure of 6.24 PSF (equivalent to 49 mph wind) when tested in accordance with ASTM E283. Mock-up test size should be approx. 10'-0 X 10'-0 in size to simulate actual field conditions.
4. There shall be no uncontrolled water penetration through the panel joints or louver components at 12 PSF (equivalent to 68.5 mph wind) when tested in accordance with ASTM E331. Mock-up test size should be approx. 10'-0 X 10'-0 in size to simulate actual field conditions.
5. The standard horizontal panel joint shall demonstrate effective rain screen and pressure equalization principles with interior seal broken at least 1" in 10 l/f of panel and any exterior seal removed when tested at a static pressure of ***15*** PSF (equivalent to 68.5 mph wind) in accordance with ASTM E331. Effective performance shall mean no water rising within the equalization chamber and no uncontrolled leakage to the interior.

1.5 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).

   a. Flame Spread – 25* or less
   b. Smoke Developed – 450 or less

   * Numerical flame spread ratings are not intended to reflect hazards presented by these materials under actual fire conditions.

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. Ignition temperature of the foam plastic core shall have been established per ASTM D1929.
6. Panels shall be approved for use without the requirement of a thermal barrier or automatic sprinkler.

1.6 WARRANTY

A. The manufacturer shall warrant for a period of one year that the panel and window system frame materials will be free from defects. The wall systems contractor shall warrant for a period of one year that the installation workmanship will be free from defects.

B. Painted finish warranties shall be the paint manufacturer's standard 20-year warranty for wall panels and finished extrusions.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN

A. Flat panels with integral reveals.

1. 3-inch thickness in the main panel field and ***2*** 3/16 inch thick in the reveal area. ***Reveal depths not meeting this requirement shall include an additional black metal trim applied to the reveal.***
2. 36-inch standard panel module.
3. Reveal width for horizontal panels is ½ inch.
4. Minimum width of the main panel field is 8 inches.
5. The face of the panel shall be flat with smooth surface.

B. Basis of Design: 3-inch Formawall Dimension Series Factory Foamed Horizontal Panel as manufactured by Centria.

C. Joinery for flat panels:

1. Double tongue and groove side joint joinery that can be used vertically and horizontally and can integrate with any combination of flat 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 along the panel length and a 2-3/8-inch baffle interlock to provide effective rain screen and pressure equalized performance as demonstrated by testing specified in 1.04, D.
4. Joinery shall be designed to prevent entrapment of moisture, which may occur during the storage and construction process due to dynamically driven rain. Gutter interlock shall be designed to prevent moisture from becoming trapped within the foam core and shall clearly demonstrate the ability of moisture to escape to the exterior along the panel length.
5. Vertical joints for insulated metal panels shall be gasketed, exposed wet seals are not permitted. Outer wings of gasket shall compress against the metal return flange (trimless end) of the panel face. A continuous back-up flash behind the vertical joint is required with two beads of field sealant applied between the panel and back up flashing for each panel.

D. Trimless ends shall be provided at panel ends.

E. Panels shall be foamed in-place between the metal skins 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 face and liner.

F. All panel face and liner elements shall be roll formed to insure consistency of shape and joinery.

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

H. The foam core shall have a minimum density of 2.7 PCF and minimum tensile and compressive strength of 20 PSI ***and contains no CFC compounds***.

2.2 INTEGRATED LOUVERS

A. Extruded louvers will be supplied by CENTRIA as a part of the Dimension Series Wall Panel and Formavue Window System. The complete system will be engineered and installed as a single source responsibility wall system including wall panels, louvers, and steel through tube supports. The louvers will include blades; special heads, sill and jambs that integrate with the metal panels joinery; and accessories at locations as shown on the drawings.

1. The Louver Frame shall integrate with the surrounding panel joinery without face sealing and be tested to perform at 12 PSF per ASTM E331.
2. Louver Model: RS-7315 (as manufactured by Construction Specialties Group.

B. Bird Screens

1. Unless otherwise indicated, all louvers to be furnished with mill finish bird screens.
2. Screens to be 5/8 inch (15.9 mm) mesh, 0.050 inch (1.27 mm) thick expanded and flattened aluminum bird screen secured within 0.055 inch (1.40 mm) thick extruded aluminum frames. Frames to have mitered corners and corner locks.

C. Blank Offs

1. Furnish where indicated on the drawings blank-off panels fabricated by the louver manufacturer.
2. Blank-off panels to be 2” (50.8 mm) thick and to be faced on both sides with 0.032” (0.81 mm) thick aluminum sheet. Panels to be fabricated with an expanded polystyrene (EPS) core having an R-value of 8 ($0F*ft^2*h/Btu$). Panel perimeter frame to be 0.050” (1.27 mm) thick-formed aluminum channels. Panel frame to be mitered at the corners. Panels to be finished to match louvers.

2.3 TRIM

A. The wall panel manufacturer shall furnish extruded trim. Installation shall be by the certified wall systems contractor except for those that require completion of work by other trades such as gravel stops.

2.4 MATERIALS AND FINISHES

A. Panels:

1. Exterior skin of the flat panels with integral reveals shall be ASTM A653, grade 37, 22-gage G90 galvanized steel.
2. Interior skin for all panels shall be ASTM A653, grade 37, 26-gage G90 galvanized steel.
3. Exterior finish on G90 galvanized steel shall be:

    a. DURAGARD PLUS consisting of 0.8 mil primer with 0.8 mil 70% Hylar 5000 or Kynar 500 color coat and 0.8 mil 70% Hylar 5000 or Kynar 500 clear coat.

4. Interior finish shall consist of 0.2-mil primer with 0.6-mil acrylic in Arctic Ice color or other finish and color from the manufacturer's standards.

B. Integrated Louvers and Extruded Trim

1. Extrusion material shall be 6063 – T5 or 6560-T5 aluminum.
2. All exposed extrusion areas shall be finished to match panel.

C. Formed Trim

1. Gauges as required.
2. Finish to match Panel.

D. Exposed panel gaskets at trimless ends shall be manufacturers standard.

1. Material may be EPDM, Neoprene, or silicone, black color in sizes suitable for the joint width.

E. Manufacturing of Formawall Dimension Series and related trim shall be performed **IN THE USA**.

PART 3 - EXECUTION

3.1 SUBMITTALS

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

B. Shop and erection drawings shall clearly illustrate the details required to comply with the performance requirements specified including interface of the panel and window system with adjoining construction.

1. Materials and finish for each component shall be defined.
2. Erection procedures will be included where required to clearly explain proper installation of fasteners, trim, gaskets and sealants.
3. Calculations supporting structural performance shall be prepared by a Professional Engineer in the state of Maine.
4. Samples shall be submitted to illustrate the panel design, texture, color and other features specified.

3.2 INSPECTION

A. The wall systems contractor in accordance with section 1.4, B, 1, shall check final alignment of the secondary steel supports for the panel and window system.

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

3.3 FABRICATION

A. The panel 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.

3.4 INSTALLATION

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

B. Installers of panels and other components shall be trained, tested and certified by the manufacturer to erect the specified products.

C. Install the panel system, fasteners, trim and related items in accordance with dimensions and procedures shown on the approved shop and erection drawings.

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

E. Work shall be coordinated with other trades as required to insure proper flashing and seals to adjoining construction.

3.5 DAMAGED MATERIAL

A. Damage caused by the manufacturer or wall systems contractor shall be replaced or repaired to as new condition.

B. The construction manager for the project shall inspect and approve each completed wall and window area and be responsible for protection of completed work from damage by other trades.

3.6 CLEANING

A. The contractor shall remove all protective materials and labels from the wall and window system as the system is erected.

B. The contractor shall be responsible for final cleaning of the wall system. Cleaning is to be done in accordance with the manufacturers instructions.

END OF SECTION 07412