SECTION 07 42 43 COMPOSITE WALL PANELS

HIGH-PRESSURE LAMINATE EXTERIOR (COMPOSITE WALL) PANELS

PART 1 - GENERAL

1. SUMMARY
   A. Section Includes: Exterior Grade Phenolic (EGP) wall panel system and accessories as required for a complete ***drained and back-ventilated rainscreen*** system.
      1. High-pressure laminate exterior grade panel system and attachment systems.
         a. Wall panels
         b. Fascia
         c. Horizontal soffits
      2. Breathable WRB (Weather Resistive Barrier) material.
   B. Related Sections:
      1. Division 4
         a. Section 04 22 “Concrete Unit Masonry”
      2. Division 5
         a. Section 05 40 “Cold-Formed Metal Framing”
         b. Section 05 50 “Metal Fabrications”
      3. Division 6
         a. Section 06 16 “Sheathing”
      4. Division 7
         a. Section 07 21 “Thermal Insulation”
         b. Section 07 25 “Water-Resistive Barriers/Weather Barriers”
         c. Section 07 65 “Sheet Metal Flashing and Trim”
      5. Division 9
         a. Section 09 29 “Gypsum Board”

1.2 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division Specification Sections, that apply to this Section.

1.3 PERFORMANCE REQUIREMENTS

A. General: EGP wall panel system, substructure, and attachment accessories shall comply with performance requirements and design criteria indicated.

B. Delegated Design Engineering:

1. Design shall be inclusive of the EGP wall panel system and shall conform to Manufacturer's recommended installation procedures.
2. Design shall be inclusive of support structure system and all attachment accessories.

C. Structural Performance: Provide EGP wall panel system capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated based on manufacturer's most current testing standard:

1. Wind Loads: Provide EGP wall panel system, including support structure, capable of withstanding wind loads calculated according to requirements of authorities having jurisdiction or as determined based on the following minimum design wind pressures, whichever is more stringent:
   a. As determined by the American Society of Civil Engineers' ASCE 7, "Minimum Design for Buildings and Other Structures," or "Analytical Procedure".

D. Thermal Movements for Panels: Provide EGP wall panel system assemblies that allow for thermal movements resulting from the following range in ambient temperatures and that prevent buckling, joint movement, overstressing of components, failure of connections, and other detrimental effects:

1. Ambient Temperature Range: Minus 20 to plus 180 deg F.

E. Deflection Limits: Support structure and EGP wall panel system shall be designed in accordance with the manufacturer's recommended maximum deflection when tested under positive and negative design wind gust loads and shall withstand wind gust loads with horizontal deflections no greater than the manufacturer's allowable span.

F. Support System: Provide support system capable of the following:

1. Design and install support structure to accommodate expected construction tolerances and misalignment, deflection of building structural components, and openings in the building enclosure as designed.

1.4 REFERENCES

A. Reference Standards: Current edition at Date of Bid, except as otherwise specified.

B. ASTM International (ASTM) including, but not limited to:

1. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials
2. ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors under the Influence of Wind Loads
3. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials, Cycle 1

C. National Fire Protection Association (NFPA):

1. NFPA 268 – Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source
2. NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
3. NFPA 259 – Standard Test Method for Potential Heat of Building Materials

D. International Code Council (ICC) - AC 92

1.5 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.

B. Shop Drawings: Submit plan, section, elevation and perspective drawings necessary to describe and convey the layout, profiles and product components, including edge conditions, panel joints, fixture location, anchorage, accessories, finish colors, patterns and textures. Distinguish between factory-and field-assembled work.

C. Samples: For each type of exposed finish required, prepared on samples of size and type indicated below for approval:

1. EGP Wall Panels: Minimum 3" x 3" including fasteners and other wall panel accessories as required.
2. Support Structure: 12" long including fasteners and other accessories. Submit samples demonstrating materials, colors, and fastener attachment type.

3. For each finished product specified, two sets of color chips of the specified color shall be submitted. Please note that samples are only representative for color and pattern and not for thickness or edge finish. Metallic colors may show a slight fluctuation in appearance do to the metal flake orientation from batch to batch.

D. Code Compliance: Documents showing product compliance with local building codes shall be submitted prior to the bid. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product. Alternate materials must be approved by the architect of record prior to the bid date.

E. Installer Qualification Data: Installer to provide proof of competence in handling and installing EGP wall panel system as specified in construction documents and drawings.

F. Engineering Calculations: Submit engineering calculations as required by the local building code, showing that the installed panels and attachments system meets the wind load requirements for the project.

1.6 SYSTEM DESCRIPTION

A. Exterior Rainscreen Assembly: EGP wall panel system, aluminum or galvanized substructure, attachments system components, air/vapor barrier membrane, and all accessories necessary for a complete rear-ventilated, ***weather-tight*** (code compliant) exterior rainscreen wall system installation. Back-ventilated self-weeping panel and drainage track system based on the Rainscreen Principle, and shall include, but is not limited to the following:

1. Design, engineering, fabrication and installation of pre-finished EGP wall panel system including the support and attachment system.
2. Pre-finished metal flashings, fascias, trim, and closures used in conjunction with the exterior panels.
3. All supports and attachment devices as required for secure and complete installation.
4. All sub-frames, angles, steel reinforcing bars, struts, metal anchors, clips, girts, bolts, nuts, screws, and shims as necessary to properly erect, align, and secure all work under this Section (including sub-framed; furnished and erected) under the supervision of one Contractor.

5. Sealing penetrations through the air barrier system required to accommodate the installation and support and attachment systems under the Work of this Section as per air barrier system manufacturer.

1.7 DEFINITIONS

A. EGP wall panels: Rigid homogenous flat panels manufactured utilizing thermosetting resins reinforced with cellulose fibers, produced under high temperature and pressure and with integral properties and fire resistive qualities for use as an exterior wall panel material.

B. Wall Panel Assembly: Wall panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete weather-tight wall system.

C. Rainscreen Principle: Method for controlling rain penetration through wall cladding system. Open joints allow air pressure in cavity behind cladding to equal outside air pressure, thus resisting wind-driven rain.

1.8 QUALITY ASSURANCE

A. Manufacturer: All primary panel products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience, manufactured in accordance with ISO 9001 and ISO 14001.

B. Engineering: Preparation of necessary drawings, design calculations, and other structural data to be completed by a qualified professional engineer. The engineer must be legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of panels that are similar to those indicated for this Project in material, design, and extent.

C. Fabrication: A shop that employs skilled workers that custom fabricate EGP wall panel systems similar to those required for this Project and whose finished products have a record of successful in-service performance.

D. Installation: A firm experienced in the installation of EGP wall panel systems and that have experience installing products indicated for this Project. All products listed for this Section are to be installed by a single installer suitable for the execution of the Work.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical wall, corner and soffit as shown on construction documents on one side of one building including supports, attachments, and accessories.
      a. Include four-way joint for wall panels.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
   4. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed EGP wall panel system. An undamaged field sample may become part of the completed Work.

F. Pre-Installation Conference: Conduct pre-installation conference originating at the project site prior to commencing construction of mock-up specified herein to verify project requirements.
   1. Review EGP wall panel system installation requirements including substrate surface preparation, environmental limitations, typical details and flashings, Manufacturer's recommended installation procedures, coordination with adjacent trades, testing and inspection procedures, protection and repair procedures.
   2. Ensure all sub-trades interfacing with or affected by the construction of the EGP wall panel system are participating, including Architect, General Contractor, EGP wall panel system Manufacturer, mock-up and commissioning testing agencies, air barrier installer, exterior insulation installer, structural substrate installer, plumbing installer, window installer, electrical installer and any other installer whose work interfaces with or affects the EGP wall panel system.
   3. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays, including:

a. Methods and procedures related to panel installation, including manufacturer's written instructions and repair procedures after panel installation.
b. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
c. Flashings, penetrations, openings, and condition of other construction that will affect panels.
d. Governing regulations and requirements for insurance, certificates, and testing and inspecting, if applicable.
e. Temporary protection requirements for panel assembly during and after installation.
f. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.9 PERFORMANCE REQUIREMENTS

A. General Performance: Wall panel assemblies shall comply with performance requirements in project documents without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Design and Structural Performance: Wall panel assemblies and substructure shall be designed and installed to be capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated, based on recognized test methods:

1. Dead Load of Panel
2. Wind Loads: Provide exterior rainscreen wall panel system, including support structure, capable of withstanding wind loads calculated according to requirements of authorities having jurisdiction or as determined based on the specified minimum design wind pressures, based on the governing project documents:
   a. Uniform pressure as indicated on Structural Drawings.
3. Deflection Limits: Support structure and EGP wall panel system shall be designed in accordance with the Manufacturer's recommended maximum deflection when tested under positive and negative design wind gust loads and shall withstand wind gust loads with horizontal deflections no greater than the Manufacturer's allowable span.

4. Environmental Movements: Allow for environmental movements from ambient and surface condition changes by preventing buckling, joint movement, overstressing of components, failure of optional joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
    a. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, soffit panels, and other manufactured items so as not to be damaged or deformed. Package panels for protection during transportation and handling.
    1. Unload EGP wall panels in a manner to prevent bending, warping, twisting, and surface damage.
B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits specified by manufacturer for optimum results. Do not install products when environmental conditions outside the manufacturer's specified limits are present.
C. Storage:
    1. Store EGP wall panel system on a flat, stable horizontal surface, elevated above the ground, and protected from direct sunlight until panels are ready to install.
    2. Do not store EGP wall panels or fabricated panels vertically.
    3. Store EGP wall panel system to ensure dryness, with positive slope for drainage of water. Do not store panels in contact with other materials that might cause staining or other surface damage. Do not allow storage space to exceed 120 deg F.
D. Handling:
    1. When moving panels, lift evenly to prevent dragging panels across each other and scratching the surface.
    2. Protective film should only be removed prior to installation. Installed product must have protective film, labels and stickers removed prior to installation.

E. Protect strippable protective covering on EGP wall panel system from exposure to sunlight and high humidity, except to extent necessary for period of panel installation.

1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing weather conditions permit assembly of panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify actual measurements/openings against field measurements performed by the installer prior to release for fabrication. Recorded measurements to be indicated on shop drawings based on field measurements provided by the installer. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

C. Comply with manufacturer's requirements of referenced standards and recommendations of material for environmental conditions before, during and after installation.

D. Coordinate EGP wall panel system assemblies with rain drainage work, flashing, trim, and construction of studs, soffits, and other adjoining work to provide a leak-proof, secure, and non-corrosive installation.

1.12 WARRANTY

A. Submit Manufacturer's standard limited 10 year warranty covering panel integrity and color fastness.

B. Warranty only available when panels are fabricated and installed by a contractor that has been recognized by the manufacturer.

PART 2 – PRODUCTS

2.1 EGP ENGINEERED CLADDING PANEL SYSTEM

A. Manufacturer: MEG Panels provided by ABET, Inc., 855-770-7330, 60 W. Sheffield Ave., Englewood, NJ 07631, www.megwallpanels.com; as approved by the Architect.

1. Alternate Manufacturers

1. XXXXX
2. XXXXX

B. Material Description:
   1. *Type: Single-sided Decorative [Double-sided Decorative]* as indicated on drawings or governing project documents.
   2. *Color: As selected by Architect from manufacturer's full range of Exterior MEG Colors,* as indicated on drawings or governing project documents.
   3. *Finish:* As indicated on drawings or governing project documents.
   4. Thickness: 10 mm (3/8 in.)
   5. Panel Sizes: As indicated on drawings or governing project documents.
   6. Fasteners: As designated by manufacturer and project documents.
   7. Panel Mounting System: As specified by contract documents and manufacturer's recommendations.

C. Fire Performance:
   1. Flame Spread: Less than 25 as per ASTM E 84.
   2. Smoke Development: Less than 450 as per ASTM E-84.
   3. Ignition Temperature: Greater than 650 deg F (350 deg C) above ambient, ASTM D1929.
   4. When required for compliance with local building codes, the wall cladding assembly shall show no degradation of the rating of Fire Resistant Assemblies, ASTM E119.
   5. When required for compliance with local building codes, the wall cladding assembly shall meet the performance requirements for Multi Story construction NFPA 285
   6. When required for compliance with local building codes, the wall cladding assembly shall not ignite when exposed to a radiant heat energy source, NFPA 268.

D. Mounting System: Exposed fastening on fixed-depth sub-framing.

2.2. ACCESSORIES

A. Panel Accessories: Manufacturer's standard materials and profiles meeting performance requirements. Provide components required for a complete assembly including trim and clips. Extrusions, including corner closures, joint closures and vent screens, formed members, sheet, and plate shall conform with

the recommendations of the manufacturer. Exposed accessories may or may not be required to match panel color.

B. Aluminum Trim Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use and finish indicated.

C. Steel Sheet Components, General: Complying with ASTM C 645 requirements for metal and with ASTM A 653, G60, hot-dip galvanized zinc coating.

D. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners used to withstand design loads. Optional: provide exposed fasteners with heads of a specified color or matching wall panels by means of plastic caps or factory-applied coating. Fasteners for Miscellaneous Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

E. Joint Sealants: As recommended by manufacturer to provide weather-tight installation, suited to condition involved.

F. Building Wrap: For installation over wall sheathing, AC38 Grade "D" Compliant or ASTM E 1677, Type I air retardant, UV stabilized.

G. Joint Closures: Corrosion resistant metal "tongues" for insertion into kerfs in panel edges. Color as selected by Architect from manufacturer's full range.

2.3 FABRICATION

A. General: Fabricate EGP wall panel system and accessory materials in accordance with Manufacturer's written instructions and approved submittals, and at a fabrication facility recognized by Manufacturer. Comply with indicated profiles and within dimensional and structural requirements. No voids, air spaces, or foamed insulation in the core material is permitted.

1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
2. Optional: Fabricate panels with panel stiffeners as required to maintain fabrication tolerances and to withstand design loads.
3. Optional: Fabricate wall panels with joints between panels formed with metal "tongues" inserted into kerfs in panel edges.

B. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
   1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

C. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.

D. Appearance: Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.

E. Panel Edges: All factory produced panels edges will be cut, sanded and rounded to a smooth finish. No factory panel edges should be used as part of the final installed panel.

PART 3 – EXECUTION

1. EXAMINATION AND PREPARATION

A. Examine substrates, areas, and conditions, for compliance with requirements for installation tolerances of structural substrate, support structure, EGP wall panel system, and other conditions affecting performance. Notify Architect/General Contractor in writing of conditions detrimental to proper and timely completion of work.
   1. Verify that substrate conditions, wall framing, and other structural panel support members and anchorages installed under other Sections are acceptable for product installation and have been installed within acceptable tolerances in accordance with project documents. Verify wall sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by project documents. Surfaces to receive panels shall be even, smooth, dry, and free from defects detrimental to the installation of the panel system. Verify exterior sheathing is plumb and level, and to specific project specifications.

2. Verify that air- and weather-resistant barrier has been installed over structural sheathing in accordance with air barrier Manufacturer's recommended installation instructions and terminated properly at openings to prevent air infiltration or water penetration.
3. Check rough-in installation for components and systems adjacent to and penetrating into EGP panels to verify actual locations of penetrations relative to joint locations of panels prior to installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of any unsatisfactory conditions that require correction before panel installation can proceed.
C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
D. Do not proceed with installation until all unsatisfactory conditions have been corrected.

3.2 PANEL INSTALLATION

A. Install EGP wall panel system plumb and level and accurately spaced per Manufacturer's written installation instructions and in accordance with approved Shop Drawings.
   1. Install flashing and trim as EGP wall panel system work proceeds.
   2. Provide weather-tight escutcheons for pipe and conduit penetrating exterior panels.
B. Fasten EGP wall panels to support structure with fasteners approved for use with adjoining construction and in accordance with approved Shop Drawings for color matching and compliance with wind load and engineering requirements to allow for necessary movement and structural support.
C. Do not install panels or component parts which are observed to be defective or damaged including, but not limited to: warped, bowed, abraded, scratched and broken.
D. Do not cut or trim component parts during installation in a manner that would damage the finish, decrease the strength or result in visual imperfection or a failure in performance. Return component parts with required alteration to the shop for re-fabrication or replacement.

E. Install accessories with positive anchorage to building and weather-tight mounting and provide for thermal expansion. Coordinate installation with flashing and other components.
   1. Install components required for a complete EGP wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips and similar items.

F. Do not apply sealant to EGP wall panel system joinery unless otherwise indicated on Drawings or in accordance with Manufacturer's recommended installation instructions.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual". Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather-resistant.

H. Support Structure: Install clips, L-shapes, J-shapes, Z-shapes, hat channels, fillers, and other components in accordance with approved Shop Drawings and Manufacturer's recommended installation instructions.

I. Install support structure framing level and plumb and within tolerances of the complete system as approved and recommended by Manufacturer and in accordance with approved Shop Drawings.

J. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous panel support members and anchorage according to ASTM C 754 and panel manufacturer's written recommendations.

K. Panels should be inspected prior to installation to assure materials are free from visual or aesthetic defects that may have occurred once the panels have left the factory.

3.3 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weather-tight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather-resistant.
    1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
    2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather-resistant and waterproof, form expansion joints of intermeshing hooded flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
C. Brackets and Support Rails: Attach brackets and rails with engineered fasteners and anchors to accomplish performance requirements.

3.4 ERECTION TOLERANCES

A. Install EGP wall panel system plumb, level and accurately spaced per Manufacturer's written installation instructions and in accordance with approved Shop Drawings and Project Documents and Specifications.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of panel installation, clean finished surfaces as recommended by panel manufacturer. Maintain a clean condition during construction.
B. Remove excess sealant and smears as paneling is installed.
C. After panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
D. On completion of wall panel installation, clean finished surfaces as recommended by panel manufacturer.

E. Replace panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
F. Operation and Maintenance Data: Submit operation, maintenance, and cleaning information for products covered under this section.
G. The use of abrasive cleaner or cleaning tools is not recommended by the manufacturer.

END OF SECTION