KORWALL INDUSTRIES

SECTION 06120

STRUCTURAL INSULATED PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural Insulated Roof Panels.

B. Structural Insulated Wall Panels.

1.2 RELATED SECTIONS

A. Section 06100 - Rough Carpentry.

B. Section 06110 - Wood Framing.

C. Section 06130 - Heavy Timber Construction.

D. Section 06201 - Exterior Finish Carpentry.

1.3 REFERENCES

A. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

B. ASTM E 1803 - Standard Test Method for Determining Structural Capacities of Insulated Panels.

C. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

D. ASTM E 1333- Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.

E. APA DOC PS2 - Performance Standard for Wood-based Structural-Use Panels.

F. APA PRP-108 - Performance Standards and Qualification Policies for Structural-Use Panels.

G. ICC ES AC04 - Acceptance Criteria for Sandwich Panels.

H. ICC ES AC05 - Acceptance Criteria for Sandwich Panel Adhesives.

I. ICC ES AC12 - Acceptance Criteria for Foam Plastic Insulation.

J. EPA - Registered products listing.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Code Compliance: Provide code report / material listing report for Structural Insulated Panels showing evidence of compliance with code requirements. Submit current compliance report number from an International Accreditation Service (IAS) Accredited Product Certification Agency that has demonstrated compliance with ISO Guide 65, General requirements for bodies operating product certification systems, showing conformance to the International Building Code (IBC) and International Residential Code (IRC). Provide code report / material listing report for the Structural Insulated Panel showing panels may be used as shear walls in all Seismic Design Categories A, B, C, D, E and F.

B. EPS Code Compliance: Provide ICC ES code report for EPS foam with evidence of compliance with applicable code. Submit current compliance report numbers from ICC ES with conformance to the International Building Code (IBC) and International Residential Code (IRC). Code report shall include compliance with ICC ES AC12.

C. Mastic: Provide MSDS data showing mastic has either 300 g/l or less VOC content or zero g/l VOC content depending on which mastic is required to meet specified requirements.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. 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.
   3. Installation methods including panel manufacturer's construction detail book and load design charts.
   4. Code report(s) showing evidence of compliance to applicable code.
   5. UL construction number or a code report / material listing report describing each fire-rated assembly with UL certificate showing flame spread and smoke developed information.

C. Shop Drawings: Submit shop drawings for structural insulated panels showing layout, elevations, product components and accessories.

D. Calculations: Submit structural calculations by a design professional registered in the state the project is being constructed in and qualified to perform the design work.

E. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
   1. Product Data for Credit MR 2.1 and 2.2: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for Credit MR 4.1 and MR 4.2: For products having recycled content, documentation including percentages by weight of post consumer and preconsumer recycled content
      a. Include statement indicating costs for each product having recycled content.
   3. Product Data for Credit EQ 4.1: For adhesives used to laminate gypsum board panels to substrates, including printed statement of VOC content
   4. Product Data for Credit EQ 4.4 Low-Emitting Materials, Composite Wood and Agrifiber: Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers

and occupants. Include statement that the composite wood products used in the panel system contain no added urea-formaldehyde resins.

5. Product Data for Credit MR 5.1 and Credit MR 5.2: Submit data, including location and distance from Project of material manufacturer and point of extraction, harvest or recovery for main raw material.
    a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.

F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Manufacturer's Certificates: Certify products meet or exceed specified requirements including:
1. Product certificate showing compliance to Third Party Quality Control program of PFS.
2. EPS Insulation manufacturer's certificate showing compliance to Third Party Quality Control program of PFS.
3. Submit copy of label approved by the Inspection Agency certifying that manufacture of panels complies with specified performance characteristics and physical properties.
4. Evidence that the panel manufacturer has tested the panels in accordance with ASTM E 1333 by and IAS accredited testing laboratory and the result of the testing shows formaldehyde levels below .03 ppm.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturing Member, in good standing, of the Structural Insulated Panel Association (SIPA).

B. Installer Qualifications: Installer with documented experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.

C. Certifications: Provide certification showing compliance as follows:
1. Structural Insulated Panels: A Third Party Quality Control program of Underwriters Laboratories, Inc. with labels of approval.
2. Expanded Polystyrene Core: A Third Party Quality Control program of Underwriters Laboratories, Inc. with labels of approval.
3. Evidence that panels have been tested in accordance with ASTM E 1333 by an IAS accredited testing laboratory with formaldehyde levels below .03 ppm.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship is approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

E. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, foundation/structural system/substrate conditions, panel manufacturer's installation instructions and warranty requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with identification labels or markings intact until ready for installation.

B. Products shall be fully supported in storage and prevented from contact with the ground. Stack on pallets or on supports at a maximum of 4 feet on center.

C. Store in a protected area and protect against exposure to rain, water, dirt, mud, and other residue that may affect performance. Cover stored products with breathable protective wraps.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard lifetime limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Korwall Industries, which is located at: 326 N. Bowen Road, Arlington, Texas, 76012. (817) 277-6741 FAX: (817) 277-6743

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 STRUCTURAL INSULATED PANELS

A. Description: Custom fabricated stressed skin structural insulated panels consisting of an expanded polystyrene core pressure laminated to OSB with sandwich panel adhesives as follows:
   1. Core: UL certified EPS core with insect resistant treatment, complying with ≈STM C 578 Type I. Insulation manufacturer shall provide Third Party UL certificate.
   2. Facing: OSB identified with APA or PFS performance mark with Exposure I durability rating and performance in accordance with DOC PS-2 span rating 24/16 or greater.
   3. Adhesives: Laminating Adhesives shall be in conformance with ICC ES AC05 - Acceptance Criteria for Sandwich Panel Adhesives.

B. Panel Thickness and Thermal Resistance, R-value:
   1. 4-1/2 inches (114 mm) thick with an R-value of 15.0 at 75 degrees F and an R-value of 16.0 at 40 degrees F.
   2. 6-1/2 inches (165 mm) thick with an R-value of 23.0 at 75 degrees F and an R-value of 24.0 at 40 degrees F.
   3. 8-1/4 inches (210 mm) thick with an R-value of 29.0 at 75 degrees F and an R-value of 31.0 at 40 degrees F.
   4. 10-1/4 inches (260 mm) thick with an R-value of 38.0 at 75 degrees F and an R-value of 39.0 at 40 degrees F.
   5. 12-1/4 inches (311 mm) thick with an R-value of 46.0 at 75 degrees F and an R-value of 47.0 at 40 degrees F.

2.3 ACCESSORIES

A. Splines: OSB or I-beam for use in joining structural insulated panels as provided by

the panel manufacturer.

B. Fasteners: Corrosion resistant structural insulated panel screws suitable for the intended purpose that is compatible with panel system and provided by the panel manufacturer.
   1. Wood Screws for attachment to wood members.
   2. Heavy Duty Metal Screws for attachment to metal members (16 gauge to 1/4 inch).
   3. Light Duty Metal Screws for attachment to metal decks (18 gauge or thinner).

C. Structural Insulated Panel Mastic: Mastic provided by the panel manufacturer that is specifically designed for use with structural insulated panels and compatible with all components of the panel. Mastic shall have either 300 g/l or less VOC content or zero g/l VOC content depending on mastic required.

D. Dimensional Lumber: SPF, #2 or better, or engineered equivalent unless otherwise required by Drawings.

2.4 FABRICATION

A. Fabricate panels in accordance with approved shop drawings.

B. Wiring Chases: If indicated or required, shall be cut into the panel during the manufacturing process.

2.5 SOURCE QUALITY CONTROL

A. Source Quality Assurance: Structural insulated panel components shall be supplied by Structural Insulated Panel manufacturer.
   1. Each panel shall be labeled indicating PFS or other ISO Guide 65 approved Third Party certification.
   2. Provide evidence of UL Third Party inspection and labeling of all insulation used in panels.
   3. Submit Manufacturer's Lamination/R-Value certification documents to the Architect.
   4. Dimensional Tolerance shall comply with values listed in the manufacturer's Quality Control Manual.

B. Source Quality: Obtain structural insulated panels from a single manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify conditions of foundation, structural system, framing substrate and other conditions, which may affect installation of structural insulated panels.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions. Comply with manufacturer's ICC-ES or material listing report, load design charts, details, shop drawings, and product data, including product technical bulletins, for installation.

B. Install panels level and square on substrates that support wall and roof. For walls, hold sill plate back from edge of rim board 1/2 inch (12 mm) to allow full bearing of OSB skins. Provide 1-1/2 inch (38 mm) diameter access holes in plating to align with electrical wire chases in panels. Provide adequate bracing of panels during erection. Remove debris from plate area prior to placement.

C. Connect panels by nails or staples as shown on Drawings. Screws of equal strength may be substituted for nails and staples as specified by the Architect. Structural Insulated Panel Mastic must be used together with each fastening techniques. Where screw fasteners are used, provide a minimum of 1 inch (25.4 mm) penetration into support. Join panels using plates and splines. Secure attachment with nails, staples, or screws, and mastic. Apply mastic following panel manufacturer recommendations.

D. Provide Structural Insulated Panel Sealant at joints between wall panels, roof panels and at intersection of roof and wall panels and as shown in panel manufacturer's details.

E. Provide vapor retarders indicated on the Drawings and mandated by building code.

F. Interior surfaces of structural insulated panels shall be finished with a minimum 15 minute thermal barrier, such as gypsum wallboard, nominal 1 inch (25 mm) wood paneling, or other approved materials. Apply code approved thermal barriers according to panel manufacturer's recommendations.

G. Do not install structural insulated panels directly on concrete. Do not put plumbing in structural insulated panels without consulting panel manufacturer. Do not over cut skins for field-cut openings and do not cut skins for electrical chases. Structural insulated panels shall be protected from exposure to solvents and their vapors that damage the EPS foam core.

H. Remove and replace insulated wall or roof structural insulated panels, which have become excessively wet or damaged before proceeding.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Protect roof panels from weather by roofing materials to provide temporary protection at the end of each days work or when rain or snow is imminent.

C. After installation, cover exposed panels to prevent contact with water on each exposed edges and faces.

D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION