

## SECTION 06120

### STRUCTURAL INSULATED PANELS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Structural Insulated Panels (SIPs).
- B. Related Sections: Section(s) related to this section include:
  - 1. Section 06100 Rough Carpentry
  - 2. Section 06090 Wood and Plastics Fastenings

##### 1.02 SYSTEM DESCRIPTION

Structural Insulated Panels (SIPs) consist of oriented strand board (OSB) laminated with structural adhesives to an insect resistant EPS insulation core, and SIP Manufacturer supplied connecting splines, sealants, and SIP screws.

##### 1.03 REFERENCES

- A. ACSE 7 - Minimum Loads for Buildings and other Structures.
- B. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- C. ASTM E1803 – Standard Test Method for Determining Structural Capacities of Insulated Panels
- D. DOC PS2 – Performance Standard for Wood-based Structural-Use Panels.
- E. ICC ES AC04 – Acceptance Criteria for Sandwich Panels.
- F. ICC ES AC05 – Acceptance Criteria for Sandwich Panel Adhesives.
- G. ICC ES AC12 – Acceptance Criteria for Foam Plastic Insulation.
- H. AWPA E12- Standard Method of Determining Corrosion of Metal in Contact with Treated Wood.
- I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- J. EPA - Registered products listing.

##### 1.04 SUBMITTALS

- A. Product Data: Submit product data for specified products.
  - 1. SIP Code Compliance: Provide ICC ES code report for SIP with evidence of compliance with code requirements as an alternate method of construction. Submit current compliance report number from ICC ES showing conformance to the International Building Code (IBC) and International Residential Code (IRC). Code report shall include compliance with ICC ES AC04.
  - 2. EPS Code Compliance: Provide ICC ES code report for EPS foam with evidence of compliance with 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.
  - 3. Manufacturer's Instructions: SIP Manufacturer's construction detail book and load design charts.
- B. Calculations: Provide structural calculations by a design professional registered in the state of [insert state] qualified to perform such work.
- C. Shop Drawings: Submit shop drawings for SIPs showing layout, elevations, product components and accessories.
- D. Quality Assurance Submittals: Submit the following:
  - 1. Certificate: Product certificate showing compliance to Third Party Quality Control program of Underwriters Laboratories, Inc.
- E. Fire Resistant Assemblies: UL construction number for each fire-rated assembly
- F. Warranty: Warranty documents specified herein.

##### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.
- B. Source Limitations: Obtain all SIPs through one manufacturer. All accessories to be furnished or recommended by the SIP manufacturer.

##### 1.06 REGULATORY REQUIREMENTS

- A. SIPs shall be recognized for compliance in a current ICC ES evaluation report.
- B. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, foundation/structural system/substrate conditions, SIP manufacturer's installation instructions and SIP manufacturer's warranty requirements.

Comply with Division 1 Project Management and Coordination (Project Meetings) Section.

#### 1.07 DELIVERY, STORAGE & HANDLING

- A. Ordering: Comply with SIP manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Delivery: Deliver materials from SIP manufacturer with identification labels or markings intact.
- C. Off-load SIPs from truck and handle using fork lift or other means to prevent damage to SIPs.
- D. SIPs shall be fully supported in storage and prevented from contact with the ground. Stack SIPs on pallets or on supports at a maximum of four feet on center.
- E. SIPs shall be fully protected from weather. Protect against exposure to rain, water, dirt, mud, and other residue that may affect SIP performance. Cover stored SIPs with breathable protective wraps. SIPs shall be stored in a protected area.

#### 1.08 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit SIP manufacturer's standard warranty document. SIP Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
  - 1. Warranty Period: [Specify term.] years commencing on Date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURES / SUPPLIERS

- A. Premier Building Systems, 4609 70<sup>th</sup> Avenue East, Fife, WA 98424. Phone 800-275-7086
- B. Premier Building Systems, 3434 West Papago Street, Phoenix, AZ 85009. Phone 800-240-6691
- C. Insulfoam, LLC, 1019 Pacific Avenue, Suite 1501, Tacoma, WA 98402

#### 2.02 MATERIALS

- A. SIPs consisting of the following:
  - 1. UL certified EPS core with insect resistant treatment, minimum of 0.95 pcf (15.2 kg/m<sup>3</sup>) complying with ASTM C578 Type I. Insulation manufacturer shall provide Third Party UL certificate.
  - 2. 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 shall be in conformance with ICC ES AC05 – Acceptance Criteria for Sandwich Panel Adhesives

#### 2.03 ACCESSORIES

- A. Splines: OSB, PBS Super Splines, or I-beam for use in joining SIPs shall be supplied by SIPs manufacturer.
- B. Fasteners: corrosion resistant SIP screws compatible with SIP system shall be provided by the SIPs manufacturer.
  - 1. Wood Screws for attachment to wood members
  - 2. Heavy Duty Metal Screws for attachment to metal members (16 gauge to 1/4")
  - 3. Light Duty Metal Screws for attachment to metal decks (18 gauge or thinner)
- C. SIP Sealant: Shall be specifically designed for use with SIPs. Sealant must be compatible with all components of the SIP. Sealant shall be provided by the SIP manufacturer.
- D. Dimensional Lumber: SPF, #2 or better, or engineered equivalent unless otherwise required by structural drawings.
- E. Vapor Retarder SIP Tape: Tape with an adhesive suitable for indoor use, min. 6 inch wide for use on SIP joints. SIP Tape shall be supplied by the SIP manufacturer.

#### 2.04 FABRICATION

- A. Sizes: SIPs shall be fabricated in accordance with approved Shop Drawings
- B. Thermal Resistance, R-value

\*\*\*Note to Specifier\*\*\* Select the R-value as required for each area of construction. Typically, 4" & 6" panels are used for walls, 8", 10" & 12" panels are used for floors and roofs.

- 1. 4 1/2" (114 mm) thick SIP with R-value of 15.0 at 75°F
- 2. 6 1/2" (165 mm) thick SIP with R-value of 23.0 at 75°F
- 3. 8 1/4" (210 mm) thick SIP with R-value of 30.0 at 75°F
- 4. 10 1/4" (260 mm) thick SIP with R-value of 38.0 at 75°F
- 5. 12 1/4" (311 mm) thick SIP with R-value of 46.0 at 75°F

#### 2.05 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted without fourteen day (14) prior approval.

## 2.06 RELATED MATERIALS

A. Related Materials: Refer to other sections for related materials as follows:

1. Dimensional Lumber: SPF #2 or better or pre-engineered equivalent: Refer to Division 6 Carpentry Sections.

## 2.07 SOURCE QUALITY

A. Source Quality Assurance: Each SIP component required shall be supplied by SIP manufacturer and shall be obtained from selected SIP manufacturer or its approved supplier.

1. Each SIP shall be labeled indicating UL Third Party certification.
2. Provide evidence of UL Third Party inspection and labeling of all insulation used in manufacture of SIPs.
3. SIP manufacturer shall provide Lamination, R-Value and warranty documents for building owner acceptance and execution. Manufacturer's standard forms will be submitted.
4. Provide SIPs with EPS treated for insect resistance. Treatment shall be EPA registered.
5. Dimensional Tolerance - shall comply with values listed in the manufacturer's Quality Control Manual.

B. Source Quality: Obtain SIPs from a single manufacturer.

## PART 3 EXECUTION

### 3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's ICC ES report, Load Design Charts, Detail Book, Shop Drawings, and product data, including product technical bulletins, for installation.

### 3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.

1. Verify conditions of foundation/structural system/substrate and other conditions which affect installation of SIPs. Any adverse conditions shall be reported in writing to the SIP manufacturer and the design professional. Do not proceed with installation until adverse conditions are corrected.

### 3.03 INSTALLATION

A. SIP Installation:

1. SIP Supports: Provide level and square foundation/structural system/substrate that support wall and/or roof SIPs. For wall SIPs, hold sill plate back from edge of rim board 1/2" (12 mm) to allow full bearing of OSB skins. Provide 1 1/2" (38 mm) diameter access holes in plating to align with electrical wire chases in SIPs. Provide adequate bracing of SIPs during erection. Remove debris from plate area prior to SIP placement.
2. SIP Fastening: Connect SIPs by nails or staples as shown on drawings. Screws of equal strength may be substituted for nails and staples as specified by engineer. SIP sealant must be used together with each fastening techniques. Where SIP Screw Fasteners are used, provide a minimum of 1" (25.4 mm) penetration into support. Join SIPs using plates and splines. Secure attachment with nails, staples, or screws, and SIP sealant. Apply SIP sealant following SIP manufacturer recommendations.
3. SIP Tape: Provide SIP Tape at joints between SIP wall panels, roof panels and at intersection of SIP roof and wall panels.
4. Vapor Retarders: Provide vapor retarders mandated by building code.
5. Thermal Barriers: Interior surfaces of SIPs shall be finished with a minimum 15-minute thermal barrier, such as gypsum wallboard, nominal 1" (25 mm) wood paneling, or other approved materials. Apply code approved thermal barriers according to SIP manufacturer's recommendations.
6. Restrictions: Do not install SIPs directly on concrete. Do not put plumbing in SIPs without consulting SIP manufacturer. Do not over cut skins for field-cut openings and do not cut skins for electrical chases. SIPs shall be protected from exposure to solvents and their vapors that damage the EPS foam core.
7. Remove and replace insulated wall or roof SIPs which have become excessively wet or damaged before proceeding with installation of additional SIPs or other work.

### 3.04 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

1. Site Visits: [Specify number and duration of periodic site visits.].

### 3.05 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction.

1. Roof SIPs: Protect roof SIPs from weather by roofing materials to provide temporary protection at the end of the day or

when rain or snow is imminent.

2. After installation, cover SIPs to prevent contact with water on each exposed SIP edges and faces.

**END OF SECTION**