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

A. Structural Insulated Panels (SIPs) consist of oriented strand board (OSB) laminated with structural adhesives to an insect resistant EPS insulation core, and SIP Manufacture supplier 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. ASTM E1333 – Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
I. EPA – Registered products listing.

1.04 SUBMITTALS

A. Product Data:
   1. SIP Code Compliance: Submit a code report / material listing report for SIPs showing evidence of compliance with code requirements as an alternate method of construction. 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).
   2. Shear Wall use: Submit a code report / material listing report for the SIPs showing that the SIPs may be used as shear wall Seismic Design Categories A, B, C.
   3. EPS Code Compliance: Submit 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.
   4. Enerfoam 42: Submit MSDS data showing Enerfoam 42 has 300 g/l or less VOC content.
   5. Manufacturer's Instructions: Submit SIP Manufacturer's construction detail book and load design charts.
B. 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.
C. Shop Drawings: Submit shop drawings for SIPs showing layout, elevations, product components and accessories.
D. Quality Assurance Submittals: Submit the following:

1. SIPs: Submit SIP product certificate showing compliance to Third Party Quality Control program of Underwriters Laboratories, Inc.
2. EPS Core: Submit EPS Insulation manufacturer's certificate showing compliance to Third Party Quality Control program of Underwriters Laboratories, Inc.
3. Labels: Submit a copy of the label approved by the Inspection Agency certifying that the manufacture of panels complies with specified performance characteristics and physical properties.
4. SIPA Manufacturer Member in Good Standing: Submit SIPA certificate as evidence showing SIP Manufacturer is a SIPA manufacturing member in good standing.
5. Formaldehyde Emission Rates: Submit evidence that the SIP manufacturers' panel has less than .03 ppm.

E. Fire Resistant Assemblies: Submit UL construction number or a code report / material listing report describing each fire-rated assembly.

F. Warranty: Submit warranty documents specified herein.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall 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.

C. SIP Manufacturer shall be a Manufacturing Member, in good standing, of the Structural Insulated Panel Association (SIPA).

1.06 REGULATORY REQUIREMENTS

A. SIPs shall be recognized for compliance in a current IAS accredited evaluation report or material listing 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 lumber or suitable material 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's may have under Contract Documents.
1. Warranty Period: Twenty (20) years from the date of issue of the warranty.

PART 2 PRODUCTS

2.01 MANUFACTURES / SUPPLIERS

A. sPanels Holdings LLC, 2420 Heyrend Way, Idaho Falls, ID 83402 Phone 208-552-1700

2.02 MATERIALS

A. SIPs consisting of the following:

1. UL certified EPS core, complying with ASTM C578 Type 1. 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. Laminating Adhesives shall be in conformance with ICC ES AC05 – Acceptance Criteria for Sandwich Panel Adhesives.

2.03 ACCESSORIES

A. Splines: OSB, Box Spline, or I-Joist for use in joining SIPs shall be supplied by SIPs manufacturer.
B. Fasteners: corrosion resistant SIP screws and washers 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 ¼")
   3. Light Duty Metal Screws for attachment to metal decks (18 gauge or thinner)
C. SIP Enerfoam: Must be compatible with all components of the SIP. Enerfoam 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/outdoor 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 (@ 40 degrees)

   4½" (114 mm) thick SIP with R-value of 18.0
   6½" (165 mm) thick SIP with R-value of 25.0
   8¼" (210 mm) thick SIP with R-value of 33.0
   10¼" (260 mm) thick SIP with R-value of 42.0
   12 ¾" (324 mm) thick SIP with R-value of 51.0

2.05 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

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 or other ISO Guide 65 approved Third Party certification.
   2. Provide evidence of UL Third Party inspection and labeling of all insulation used in manufacturing of SIPs.
   3. SIP manufacturer shall provide Lamination/R-Value Warranty documents for building owner acceptance and execution. Manufacturer's standard forms will be submitted.
   4. 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 or material listing 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 production 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 ½" (12 mm) to allow full bearing of OSB skins. Provide 1 ½" (38 mm) diameter access hole 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 staples as shown on drawings. Screws or nails of equal strength may be substituted for staples as specified by engineer. Where SIP Screw Fasteners and washers are used, provide a minimum of 1 ½" (31.75 mm) penetration into the support. Join SIPs using plates and splines. Secure attachment with nails, staples, or screws.
   3. Vapor Retarders: Provide vapor retarders mandated by building code.
   4. 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.
   5. 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.
   6. 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

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