SECTION 06120

STRUCTURAL INSULATED PANELS

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\*\* NOTE TO SPECIFIER \*\* Insulfoam, a Carlisle Company; Premier Building Systems SIPS (Structural Insulated Panels) products.  
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This section is based on the products of Insulfoam, a Carlisle Company, which is located at:  
19727 57th Avenue East  
Puyallup, WA 98387  
Toll Free: 800-248-5995  
Phone: 253-271-3056  
Fax: 253-271-3265  
Web Site: www.insulfoam.com  
E-mail: [info@insulfoam.com](mailto:info@insulfoam.com)  
  
[click [Here](http://www.arcat.com/arcatcos/cos34/arc34935.html)] for additional information   
Insulfoam, LLC, one of the most respected names in polystyrene-based construction products is now even better. In May of 2007, Carlisle Construction Materials, a company known for its single-ply roof systems and waterproofing products, further broadened its product offering by acquiring Insulfoam, the largest manufacturer of expanded polystyrene (EPS) in North America. The Insulfoam acquisition confirms Carlisle's overall commitment to architects, building owners and contractors who want to promote and utilize energy-efficient construction products.  
This specification includes Premier Building Systems SIPS (Structural Insulated Panels). When buildings are constructed with Premier SIPs roofs, the roof structure alone is strong enough that it doesn't need an engineered truss system. Without the need for trusses, Architects and Designers have the opportunity to use their design creativity like never before.  
The Green Factor; Imagine offering to build the entire building envelope (roofs, walls and floors) with a product that is one of the most environmentally-responsible, green building products in the industry today. Even if they are new to you, SIPs, along with their environmental benefits, have been around for more than 60 years. View our 'The Green Factor' brochure or read on to get the whole 'Green' story.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Structural Insulated Roof Panels.
    2. Structural Insulated Wall Panels.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06100 - Rough Carpentry.
    2. Section 06110 - Wood Framing.
    3. Section 06130 - Heavy Timber Construction.
    4. Section 06201 - Exterior Finish Carpentry.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
    2. ASTM E 1803 - Standard Test Method for Determining Structural Capacities of Insulated Panels.
    3. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
    4. ASTM E 1333- Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
    5. APA DOC PS2 - Performance Standard for Wood-based Structural-Use Panels.
    6. APA PRP-108 - Performance Standards and Qualification Policies for Structural-Use Panels.
    7. ICC ES AC04 - Acceptance Criteria for Sandwich Panels.
    8. ICC ES AC05 - Acceptance Criteria for Sandwich Panel Adhesives.
    9. ICC ES AC12 - Acceptance Criteria for Foam Plastic Insulation.
    10. EPA - Registered products listing.
  1. DESIGN / PERFORMANCE REQUIREMENTS
     1. 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.
     2. 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.
     3. 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.
  2. SUBMITTALS
     1. Submit under provisions of Section 01300.
     2. 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.
     3. Shop Drawings: Submit shop drawings for structural insulated panels showing layout, elevations, product components and accessories.
     4. 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.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable.

* + 1. 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
          1. 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.
          1. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
    3. Manufacturer's Certificates: Certify products meet or exceed specified requirements including:
       1. Product certificate showing compliance to Third Party Quality Control program of Underwriters Laboratories, Inc.
       2. EPS Insulation manufacturer's certificate showing compliance to Third Party Quality Control program of Underwriters Laboratories, Inc.
       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. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Manufacturing Member, in good standing, of the Structural Insulated Panel Association (SIPA).
     2. 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.
     3. 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.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. 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.
    2. 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. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging with identification labels or markings intact until ready for installation.
     2. 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.
     3. 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.
  2. PROJECT CONDITIONS
     1. 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.
  3. WARRANTY
     1. Manufacturer's Warranty: Provide manufacturer's standard 20 year limited warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Insulfoam, a Carlisle Company, which is located at: 19727 57th Ave. E.; Puyallup, WA 98387; Toll Free Tel: 800-248-5995; Tel: 253-271-3056; Fax: 253-271-3265; Email: [request info (info@insulfoam.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Insulfoam,+a+Carlisle+Company&coid=34935&rep=&fax=253-271-3265&message=RE:%20Spec%20Question%20(06120ins):%20%20&mf=); Web: [www.insulfoam.com](http://www.insulfoam.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01600.
  1. STRUCTURAL INSULATED PANELS
     1. 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 ASTM 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.
     2. Panel Thickness and Thermal Resistance, R-value:

\*\* NOTE TO SPECIFIER \*\* Select the panel thickness/R value required from the following paragraphs as required for the project If more than one thickness is required clearly indicate the location of each on the Drawings. Delete the thicknesses not required.

* + - 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.
  1. ACCESSORlES
     1. Splines: OSB, PBS Spline or I-beam for use in joining structural insulated panels as provided by the panel manufacturer.
     2. 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).
     3. 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.
     4. Dimensional Lumber: SPF, #2 or better, or engineered equivalent unless otherwise required by Drawings.
     5. Vapor Retarder Tape: Tape with an adhesive suitable for indoor use, minimum 6 inch wide for use on structural insulated panel joints, 18 inch wide for use at roof beams. Tape as provided by the structural insulated panel manufacturer.
  2. FABRlCATlON
     1. Fabricate panels in accordance with approved shop drawings.
     2. Wiring Chases: If indicated or required, shall be cut into the panel during the manufacturing process.
  3. SOURCE QUALITY CONTROL
     1. Source Quality Assurance: Structural insulated panel components shall be supplied by Structural Insulated Panel manufacturer.
        1. Each panel 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 panels.
        3. Submit Manufacturer's Lamination/R-Value certification documents to the Architect.
        4. Provide panels with EPS core treated for insect resistance. Treatment shall be EPA registered.
        5. Dimensional Tolerance shall comply with values listed in the manufacturer's Quality Control Manual.
     2. Source Quality: Obtain structural insulated panels from a single manufacturer.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. Verify conditions of foundation, structural system, framing substrate and other conditions, which may affect installation of structural insulated panels.
      3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. 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.
      2. 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.
      3. 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.
      4. Provide Structural Insulated Panel Tape at joints between wall panels, roof panels and at intersection of roof and wall panels and as shown in panel manufacturer's details.
      5. Provide vapor retarders indicated on the Drawings and mandated by building code.
      6. 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.
      7. 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.
      8. Remove and replace insulated wall or roof structural insulated panels, which have become excessively wet or damaged before proceeding.

\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if Manufacturer's field services are required. Specify number and duration of site visits required. Delete paragraph entirely if field quality control is not required.

* 1. FIELD QUALITY CONTROL
     1. Manufacturer's Field Services: Provide manufacturer's field service consisting of periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
        1. Site Visits: \_\_\_\_\_\_\_\_\_\_\_\_\_.
  2. PROTECTION
     1. Protect installed products until completion of project.
     2. 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.
     3. After installation, cover exposed panels to prevent contact with water on each exposed edges and faces.
     4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION