



Energy Saving Roof & Wall Systems

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SECTION 06 12 00

STRUCTURAL INSULATED PANELS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Structural Insulated Panels
- B. Related Sections: Section(s) related to this section include:
 - 1. Section 06 10 00 Rough Carpentry
 - 2. Section 07 21 00 Building Insulation
 - 3. Section 07 21 20 Radiant Barriers

1.02 SYSTEM DESCRIPTION

RAY-CORE Structural Insulated Panels are component product consisting of conventional 2x4, 2x6, or 2x8's spf lumber studs prepositioned 16" or 24" on center with polyurethane foam insulation molded in place between studs and foil radiant vapor barrier applied to the exterior sides of the panels.

RAY-CORE Structural Insulated Panels are installed using conventional construction methods and practices per UCC, IBC, IRC and ICC standards. RAY-CORE Panels are to be combined with standard dimensional lumber studs, plates, nailers, headers and sills, as required, supplied onsite by contractor as detailed in manufacturer's installation details meeting all 2006 building codes.

1.03 REFERENCES

- A. UCC – Universal Construction Code – Framing
- B. IBC – International Building Code - Framing
- C. IRC – International Residential Code - Framing
- D. UL-723 – Foam Surface Burning Characteristics
- E. ASTM E-72-05 - Compressive Load and Transverse Load
- F. ASTM D 1622 - Foam Density
- G. ASTM C 518 – Foam Initial K-Factor
- H. ASTM D-2856 –Foam Closed Cell Content
- I. ASTM D-2842 – Foam Water Absorption
- J. ASTM D-2126 – Foam Dimensional Stability
- K. ASTM E-96, Procedure A – Foil Permeance
- L. ASTM C-1258 – Foil Humidity Resistance
- M. UL-723 / ASTM #84 – Foil Flame Spread

1.04 DESIGN REQUIREMENTS

- A. Provide panels which have been manufactured to standard taking care to maintain performance criteria stated by manufacturer without defects, damage or failure. Provide labeling of all insulation used in the manufacture of panels. Manufacturer's listing programs shall cover both flame and physical properties.
- B. Panel manufacturer will provide R-value documents for building owner acceptance and execution upon request. Manufacturer's standard forms will be submitted.

1.05 SUBMITTALS

- A. Product Data: Submit product data for specified products
- B. Installation Guide: Submit installation guide for specified products
- C. Warranty: Warranty documents specified herein

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Installer should be experienced in performing work with a degree of experience equal to conventional wood framing construction and other conventional construction methods and practices similar to that required for this project.
- B. Source Limitations: Obtain all panels through one source.

1.06 REGULATORY REQUIREMENTS

- A. RAY-CORE Structural Insulated Panels shall be sized and installed in conformance and compliance with local codes.

1.08 DELIVERY, STORAGE & HANDLING

- A. Prior to installation, RAY-CORE Structural Insulated Panels shall be stored in a protected area and elevated to prevent ground contact and covered to prevent exposure to sunlight, moisture and the elements.
- B. Prior to installation, RAY-CORE Structural Insulated Panels shall be covered and protected from exposure to sunlight and moisture.
- C. After installation, RAY-CORE Structural Insulated Panels shall be protected from prolonged exposure to sunlight and covered to prevent contact with water and /or moisture on all exposed panel edges and faces.

PART 2 - PRODUCTS

2.01 MANUFACTURERS/SUPPLIERS

- A. RAY-CORE, INC., 2380 Gallatin Avenue, Idaho Falls, ID 83402

2.02 MATERIALS

A. RAY-CORE Structural Insulated Panels are component building panel product using proprietary manufacturing method consisting of the following:

1. Integrated SPF #2or better kiln dried or treated or engineered lumber
2. UL certified polyurethane foam – meeting manufacturer quality standards
3. Aluminum foil faced radiant vapor barrier with kraft substrate and direction reinforcing

2.03 FABRICATION

A. Sizes: RAY-CORE Structural Insulated Panels available in 2x4, 2x6 or 2x8 thicknesses and standard lengths of 92.625", 96", 104.625", 108, 120" and 144". Custom sizes available as required.

2.02 PERFORMANCE CHARACTERISTICS

A. Thermal Resistance, R-value:

RAY-CORE TYPICAL R-VALUES		
PANEL THICKNESS (IN)	ASTM C518 Standard	Tested At
	75° F	50° F
3-1/2"	25	26
5-1/2"	40	42
7-1/4"	51	52

B. Panel Dimensional Tolerances: RAY-CORE Structural Insulated Panels shall comply with values listed in the manufacturer's Quality Control Manual.

C. Structural Testing: Each RAY-CORE Structural Insulated Panel type shall meet or exceed performance standards, values, testing and applicable technical data reports when tested in accordance with:

1. ASTM E84 Surface burning characteristics for the rigid insulation core.
2. ASTM E84 Surface burning characteristics conducted for the interior and exterior surfaces of the finished panel.

PART 3 – EXECUTION

3.01 MANUFACTURE'S INSTRUCTIONS

A. Compliance: Installation shall be in strict accordance with manufacturer's published instructions and conventional construction methods and practices, and compliance per local code requirements. Deviations from conventional building methods and practices should be calculated, signed and sealed by a registered professional engineer.

B. Certification: Builders plans and panel manufacturer's installation manual

3.02 EXAMINATION

- A. Site Verification of Conditions: The contractor shall inspect conditions of substrate, grade and other conditions, which may affect the proper installation of panels. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions. Any adverse conditions are to be reported in writing to the construction manager. Do not proceed with the installation until adverse conditions are corrected.

3.03 INSTALLATION

Installation shall be in strict accordance with manufacturer's published instructions and conventional construction methods and practices and compliance per local code requirements. Deviations from conventional construction methods and practices should be calculated, signed and sealed by a registered professional engineer.

- A. Panel Supports: Provide level and square foundation/structural system/substrate to support wall and/or roof panels. Provide adequate bracing of panels during erection. Remove debris from panel edge prior to attachment of plates.
- B. Panel Fastening: Connect panels to plates by construction adhesive, nails, staples or screws as required. Where screw fasteners are used, provide a minimum of 1" penetration into support. Join panels using plates. Apply sealant following manufacturer recommendations.
- C. Tape: Provide tape at joints between panels and at intersection of roof and wall.
- D. Thermal Barriers: Internal surfaces of panels shall be finished with a minimum 15-minute thermal barrier, such as ¼" gypsum wallboard other approved materials as required by local code requirements.
- E. Restrictions: Panels shall be protected from exposure to solvents and their vapors that will damage the aluminum vapor barrier or polyurethane foam.

3.05 PROTECTION

- A. When storing RAY-CORE Structural Insulated Panels, panels shall be stored in a protected area and elevated to prevent ground contact and covered to prevent exposure to sunlight, moisture and the elements. Do not allow panels to be stored in an unsupported manner. Improper storage may cause tolerance problems in the field.
- B. RAY-CORE Structural Insulated Panels used on roof must be fully protected from weather by roofing materials or other means to provide temporary protection at the end of the day, or when rain or snow is imminent.
- C. Remove and replace Insulating wall or roof panels, which have become excessively wet or damaged before proceeding with installation of additional panels or other work.
- A. The construction manager, or his designee, shall remove all refuse created by the installation of work in this section.