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SECTION 06 12 00

STRUCTURAL 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

1.02 SYSTEM DESCRIPTION

RAYCORE Structural Insulated Panels are component product stick framing module 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 air barrier applied to the exterior sides of the panels.

RAYCORE Structural Insulated Panels are installed using conventional stick frame 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 2019 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

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

1.06 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.

1.07 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., 305 E. Elva Street, Idaho Falls, ID 83401

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 #2 or 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 come in 4 foot widths and are available in standard spf lumber 2x4, 2x6 or 2x8 thicknesses and standard lengths of 92.625", 96", 104.625", 108, 120" and 144" based on stud configuration. Custom stud configurations may be available as required.

2.04 PERFORMANCE CHARACTERISTICS

- A. Thermal Resistance, R-value—:

RAYCORE SIP PANELS TYPICAL R-VALUES		
PANEL THICKNESS (IN)	ASTM C518 Standard	Tested At 55° F
	75° F	
3-1/2"	24	26
5-1/2"	39	42
7-1/4"	50	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 MANUFACTURER'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 2" penetration into support. Join panels using plates. Apply adhesive and foam sealant to all joints, penetrations, cracks and voids to fill and seal, 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 ½" gypsum wallboard other approved materials as required by local code requirements.
- E. External Finishes: External surfaces of panels shall be finished with materials that provide protection from sunlight, weather, moisture and all elements.
- F. Restrictions: Panels shall be protected from exposure to sunlight, moisture, the elements, solvents and their vapors, and any other substance that will damage the aluminum vapor barrier or polyurethane foam.

3.04 PROTECTION

- A. When storing RAY-CORE 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 materials damage or decomposition and tolerance problems in the field.
- B. RAY-CORE Panels used on walls must be covered by an external finish to fully protect from sunlight, moisture and the elements.
- C. RAY-CORE Panels used on roof must be fully protected from sunlight, moisture and the elements utilizing tarps, roofing materials or other means to provide temporary protection at the end of the day, or when rain or snow is imminent, and permanently upon completion of construction.
- D. Remove and replace RAY-CORE panels, which have become excessively wet or damaged before proceeding with installation of additional panels or other work.
- E. The construction manager, or his designee, shall remove all refuse created by the installation of work in this section.
- F. Ordinary care and safety precautions should be followed when handling panels, as with other construction materials. Proper lifting techniques should be followed. Extra caution should be taken in wet, icy or windy conditions. Panel surface can be slippery. Exercise caution walking on panels and always use appropriate and approved fall protection. Do not walk on panels in wet, icy or windy conditions. Wear appropriate eye and dust protection when cutting panels.