SECTION 06 12 00
STRUCTURAL PANELS
(EMERCOR Structural Insulated Panels)

PART 1 - GENERAL

1. **Section Includes:**
   a. Foundations
   b. Rimboard
   c. Cantilever Soffit
   d. Garage Ceiling Panels
   e. Walls
   f. Roof
   g. Floors

2. **Related Sections:**
   a. Section 06 10 00 - Rough Carpentry: Lumber Framing.

3. **References:**
   a. Canadian Wood Council 1990. Wood Design Manual.
   b. Zhao N., Cheng J.J.R., and Bach L. 1994. The flexural creep behaviour of OSB panels under various climatic conditions. Structural engineering report No. 199 Department of Civil Engineering, University of Alberta.
   c. Bach L, Cheng J.J.R., and Zhao N. 1990 Annual Conference of the Canadian Society of Civil Engineering, Vol. III.
   d. Campbell Woodall Structural Engineers, File No. 195-1325-02, Report of Testing of Structural Load Capabilities of Emercor Structural Insulated Panels.
   e. Campbell Woodall Structural Engineers, File No. 199-1325-54, Report of Testing in Accordance with ICBO AC124 Acceptance Criteria for Wood-based Rimboard Products, Intertek Testing Services.

4. **Submittals:**
   a. Submit in accordance with Section 01300 – Submittal Procedures
   b. Product Data: Manufacturer's product data sheet for specified product.
   c. Shop Drawings: Provide Engineer sealed shop drawings indicating project layout, profiles, product components and accessories, including additional finishes not furnished by manufacturer.
   d. Manufacturer's installation instructions and details.

5. **Quality Assurance:**
   a. Installer Qualifications: Demonstrated experience in performing work on projects of similar size and complexity of the type specified in this section.
   b. Pre-installation Meetings: Conduct a pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

6. **Delivery, Storage and Handling**
   a. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
   b. Deliver materials in manufacturer's original, packaging with identification labels intact.
   c. Store materials protected from exposure to harmful weather conditions.
      i. Prevent warping and damage by supporting panels fully during storage, off the ground.
      ii. Protect from weather, moisture, and sunlight; cover with tarps or similar protective wraps depending of the type of skins used for panels.

7. **Warranty**
   a. Manufacturer's Warranty: Submit manufacturer's standard warranty document.
      i. Warranty Period: 20 years from the date of completion of installation.
      ii. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 - PRODUCTS

1. **Manufacturer**
   a. EMERCOR Ltd.
   104 Commercial Court
   Calgary, AB, Canada T3Z 2A5
   Tel: (403) 531-4346 Fax: (403) 531-4372
   Email: info@emercor.com Web site: www.emercor.com

   b. Substitutions: must be equal or exceed specifications of EMERCOR.
      i. Building Systems Panels.

   c. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2. **Applications**
   a. Design to resist design loads as specified in _____ building code without failure or damage.
      i. Wind Load _____ Exposure _____
      ii. Snow Load _____
      iii. Seismic _____

   b. Foundations: Provide panels including finish indicated on drawings.
      i. Finish of exterior face: PWF Plywood
      ii. Finish of interior face: PWF plywood, OSB (choose one type)
      iii. Thickness of panel: 4½", 6½" (choose one thickness)
      iv. Length of panel: 8' and 10'
      v. R-value: R-28 (4½"), R-44 (6½") (R-value relates to thickness)

   c. Rimboard: Provide panels including finish indicated on drawings.
      i. Finish of exterior face: OSB
      ii. Finish of interior face: OSB
      iii. Thickness of panel: 2½"
      iv. Length of panel: 8'
      v. Widths: 9½", 11⅞", 14", 16", 18", 20", 22", 24"
      vi. R-value: R-14

d. Cantilever Soffit: Provide panels including finish indicated on drawings.
   i. Finish of exterior face: PWF plywood, OSB (choose one type)
   ii. Finish of interior face: OSB
   iii. Length of panel: 8'
   iv. Thickness of panel: 2½", 4½" (choose one thickness)
   v. R-value: R-14 (2½"), R-28 (4½) (R-value relates to thickness)

e. Garage Ceiling: Provide panels including finish indicated on drawings.
   i. Finish of interior face: Drywall paper
   ii. Finish of exterior face: ⅝" Type X Drywall
   iii. Length of panel: 8'
   iv. Thickness of panel: 3¼"
   v. R-value: R-20

f. Walls: Provide panels including finish indicated on drawings.
   i. Finish of interior face: OSB, PWF Plywood, Plywood, Drywall, Cement Board (choose one type)
   ii. Finish of exterior face: OSB, PWF Plywood, Plywood, Cement Board (choose one type)
   iii. Length of panel: 8' and 10'
   iv. Thickness of panel: 4½", 6½" (choose one thickness)
   v. R-value: R-28 (4½"), R-44 (6½") (R-value relates to thickness)

g. Roof: Provide panels including finish indicated on drawings.
   i. Finish of interior face: OSB, Plywood, Drywall, Cement Board (choose one type)
   ii. Finish of exterior face: OSB, Plywood, Cement Board (choose one type)
   iii. Length of panel: 8' and 10'
   iv. Thickness of panel: 4½", 6½" (choose one thickness)
   v. R-value: R-28 (4½"), R-44 (6½") (R-value relates to thickness)

h. Floors: Provide panels including finish indicated on drawings.
   i. Finish of interior face: OSB, PWF Plywood, Plywood (choose one type)
   ii. Finish of exterior face: OSB, PWF Plywood, Plywood (choose one type)
   iii. Length of panel: 8' and 10'
   iv. Thickness of panel: 4½", 6½" (choose one thickness)
   v. R-value: R-28 (4½"), R-44 (6½") (R-value relates to thickness)

3. Materials

a. Structural Insulated Panels: Structural Insulated Panels as manufactured by EMERCOR Ltd. or equal. Factory manufactured panels shall be shot mold injected polyurethane foam core composite panels, compromising of an exterior skin (OSB, PWF, Plywood, Drywall, Cement Board) a polyurethane foam core and an interior skin (OSB, PWF, Plywood, Drywall, Cement Board) with connecting splines and fasteners.

i. Core: Polyurethane Rigid Foam

Typical Physical Properties	Value	ASTM Test Methods
Molded Panel, pcf	2.3	ASTM D-1622
Core Density, pcf	2.1	ASTM D-1622
Parallel Compressive Strength @ 10% deflection, psi	34	ASTM D-1621
Parallel Compressive Modulus, psi	1106	ASTM D-1621
Perpendicular Compressive Strength @ 10% deflection, psi	17	ASTM D-1621
Perpendicular Compressive Modulus, psi	506	ASTM D-1621
Flexural strength, psi	49	ASTM D-790
Tensile Strength, psi	49	ASTM D-1623
Porosity (%Closed cells)	91	ASTM D-2856
Water absorption, lbs/ft2	0.02-0.06	ASTM D-2842
“k” factor, BTU-IN/HR-FT2-˚F		
Initial	0.143	ASTM C-518
Aged 10 days @ 140˚F	0.152	ASTM C-518
“R” value, /inch of thickness	6.99	
“R” value aged 10 days @ 140˚F /inch of thickness	6.57	ASTM C-177-85
Flame Spread*	15	ASTM E-84
E-84 Smoke	285	ASTM E-84

* This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

ii. Faces: Complying with PS 2, APA, TECO or approved agency performance rated as Exposure 1.
iii. No formaldehyde, CFC’s, or any other harmful gases.
iv. Sizes:
    1. 48” x 96” (1219 mm x 2438 mm)
    2. 48” x 120” (1219 mm x 3047.5 mm)
v. Panel Thickness: 2½” (63.5 mm), with R-value of 14
vi. Panel Thickness: 3¼” (82.6 mm), with R-value of 20
vii. Panel Thickness: 4½” (114.3 mm), with R-value of 28
viii. Panel Thickness: 6½” (165.1 mm), with R-value of 44
ix. Dimensional Tolerances: ⅛” (3 mm)

b. Fasteners for Roof, Corners and Attachment of panels to Frames: "Olympic" Screw SIP006 or SIP008 or "Roof-grip" screw No. 12 or comparable corrosion resistant screws; as approved by panel manufacturer.
c. Fasteners for spline and plate Attachments: Zinc galvanized screws, nails, or staples min. 1¼" (32 mm) long; as approved by panel manufacturing.
d. Adhesive/Sealant: for installing splines and dimensional lumber: "PL-400" or comparable wood construction adhesive as approved by panel manufacturer.
e. Foam Sealant: "Hilti" CF-128 or comparable low to medium rise polyurethane expanding foam as approved by panel manufacturer.
f. Dimensional Lumber: Spruce-Pine-Fir No. 2 or better, or pre-engineered equivalent; as specified in Section 06100.

PART 3 - EXECUTION

4. Examination

a. Verify that substrates, including those installed by others, are acceptable for product installation in accordance with manufacturer's instructions.
b. Verify that substrates for walls are level and square.
c. Report adverse conditions in writing. Do not proceed with installation until adverse conditions are corrected.

5. Installation

a. Install in accordance with contract documents and manufacturer's installation instructions, including product data, additional engineering details, and technical bulletins.
    i. Resolve conflicts between contract documents and manufacturer's installation instructions in writing.
    ii. Do not deviate from manufacturer's standard details or load design values, unless authorized by Architect.
    iii. Do not install plumbing in panels without consulting panel manufacturer.
    iv. Do not cut skins for electrical chases.
    v. Provide adequate bracing of panels during erection.
b. Connect panels to panels using plates, splines and nails or staples with specified adhesive/sealant, and connect panels to framing using nails or staples with specified adhesive/sealant.
    i. Screws of equal strength may be substituted for nails and staples when used at an equivalency frequency with specified adhesive/sealant.
    ii. Apply adhesive/sealant in a ¼" (6 mm) bead to wood surfaces for optimum coating.
    iii. Seal joints between adjacent foam insulation with specified adhesive/sealant.

6. Cleaning and Protection

a. Protect installed products and finish surfaces from damage during construction and until completion of project.
b. Roof Panels: Cover with temporary protection immediately if wet weather is eminent. Install permanent roofing materials as soon as possible, preventing water, snow or ice contact on exposed panel joints or faces.
c. Wall Panels: Install permanent weather resistant covering as soon as possible. If more than 3 weeks will elapse before permanent covering is to be installed or if repeated precipitation is expected, install temporary breathable weather resistant covering.
d. Repair or replace damaged installed products.
e. Remove construction debris from project site and legally dispose of debris.