

## SECTION 061715 - ENGINEERED STRUCTURAL WOOD

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Structural composite lumber.
2. Prefabricated wood I-joists.
3. Engineered rim boards.

#### 1.2 ACTION SUBMITTALS

##### A. Product Data: For each type of product.

1. Include data on adhesives, fabrication, and protection.
2. For preservative-treated wood products, include manufacturer's written instructions for handling, storing, installing, and finishing treated material.
3. For connectors, include installation instructions.

##### B. Shop Drawings: Show fabrication and installation details for engineered wood members.

1. Include alternate span loading design results in design calculations.
2. Provide documentation that allowable design stresses comply with allowable design properties of each product indicated.

#### 1.3 INFORMATIONAL SUBMITTALS

##### A. Research reports.

##### B. Delegated Design Drawings:

1. Submit member and connector layout drawings for all engineered wood products signed and sealed by the responsible design professional.
  - a. Include signed and sealed computer-generated design calculations for all connector types.
  - b. Identify location and magnitude of design loads on layouts and in connector calculations.
  - c. Identify metal connectors (joist, beam, post cap, anchors, etc.) by manufacturer and model number. Include a list of accessories required for installation at each connector (blocking, squash blocks, stiffeners, fasteners, etc.). Include allowable design loads for selected metal connectors in design calculation analysis.
  - d. Identify manufacturer's recommended connector installation details in layouts.
  - e. Provide documentation that allowable design stresses comply with allowable design properties of each connector product indicated.

- C. Delegated Design Submittal: For all engineered structural wood connections. For connectors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program, complies with quality-control procedures in ASTM D5055 or ASTM D5456, and involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design structural wood connectors.
- B. Structural Performance: Structural wood connectors are to be capable of withstanding the full allowable reaction of the supported member shown on the Drawings within limits and under conditions indicated. Comply with requirements of the International Building Code (IBC) unless more stringent requirements are required by the Delegated Design Engineer.
  - 1. Design Loads: IBC and as required by Delegated Designer.
- C. Comply with applicable Codes and Standards
- D. Structural Design Standards: Comply with applicable requirements in IBC, ASCE/SEI7 and AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

### PART 2 - PRODUCTS

#### 2.1 STRUCTURAL COMPOSITE LUMBER

- A. General: Provide structural composite lumber that complies with ASTM D5456 and ASTM D2559 or research/evaluation reports acceptable to authorities having jurisdiction.
- B. Laminated-Veneer Lumber (LVL): Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored in accordance with ASTM D5456, and manufactured with exterior-type adhesive complying with ASTM D2559.
  - 1. Allowable Stresses:
    - a. Extreme Fiber Stress in Bending, Edgewise (F<sub>b</sub>): 2600 psi for 12-inch nominal- (286-mm actual-) depth members.
    - b. Modulus of Elasticity, Edgewise (E): 2,000,000 psi (13 700 MPa) .
  - 2. Moisture Protection: Factory seal edge and ends with manufacturer's standard water-resistant coating.

## 2.2 PREFABRICATED WOOD I-JOISTS

- A. Prefabricated Units: I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural webs, let into and bonded to flanges. Comply with material requirements of, and with structural capacities established and monitored in accordance with, ASTM D5055.
1. Flange Material: machine stress-rated (MSR) lumber.
  2. Web Material: OSB, Exposure 1.
  3. Structural Properties: Depths and design values not less than those indicated.
  4. Identification Marks:
    - a. Factory mark I-joists with manufacturer's name, joist series, mill identification, manufacturing date and time, name of third-party inspection agency, and ICC/CCMC code report number. Repeat identification marks at minimum 12 ft. (3.66 m) intervals.

## 2.3 ENGINEERED RIM BOARDS

- A. Prefabricated, structural panel complying with APA PRR 410, APA PRR 401, or ASTM D7672 for wood frame construction and research or evaluation report for I-joists.
1. Manufacturer: Provide products by same manufacturer as I-joists.
  2. Material: OSB or LVL.
  3. Thickness: 1-1/8 inches (28 mm).
  4. Identification Marks: Comply with APA PRR-401, rim board grade.
    - a. Factory mark rim boards with manufacturer's name, rim board series, mill identification, manufacturing date and time, name of third-party inspection agency, and ICC/CCMC code report number. Repeat identification marks at minimum 12 ft. (3.66 m) intervals.

## 2.4 FASTENERS

- A. General: Fasteners are to be of size and type indicated and to comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
  2. For pressure-preservative-treated wood, use stainless steel fasteners.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.
- E. Carbon Steel Bolts: ASTM A307 with ASTM A563 (ASTM A563M) hex nuts and, where indicated, flat washers all hot-dip zinc coated.

- F. Stainless Steel Bolts: ASTM F593, Alloy Group 1 or 2; with ASTM F594, Alloy Group 1 or 2 (ASTM F836M, Grade A1 or Grade A4) hex nuts and, where indicated, flat washers.
- G. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC308 as appropriate for the substrate.

## 2.5 METAL FRAMING CONNECTORS:

- A. Connectors to be as required by Delegated Designer.

## 2.6 METAL FRAMING ANCHORS

- A. Allowable design loads, as published by manufacturer, are to meet or exceed those of basis-of-design products. Manufacturer's published values are to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by qualified independent testing agency. Framing anchors are to be punched for fasteners adequate to withstand same loads as framing anchors.
- B. I-joist Hangers: U-shaped joist hangers with seat and nailing flanges, full depth of joist, as indicated on Drawings. Nailing flanges provide lateral support at joist top chord.
  - 1. Thickness: 0.050 inch (1.3 mm).
  - 2. Finish: Hot-dip galvanized.
- C. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
  - 1. Strap Width: 1-1/2 inches (38 mm).
  - 2. Thickness: 0.050 inch (1.3 mm).
- D. Bridging: Rigid, V-section, nail less type, 0.050 inch (1.3 mm) thick, length to suit joist size and spacing.
- E. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch- (50-mm-) minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.
- F. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.
  - 1. Width: 3/4 inch (19 mm).
  - 2. Thickness: 0.050 inch (1.3 mm).
  - 3. Length: 16 inches (400 mm).
- G. Materials: Unless otherwise indicated, fabricate from the following materials:
  - 1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
    - a. Use for interior locations unless otherwise indicated.

2. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
3. Stainless steel bars and shapes complying with ASTM A276/A276M, Type 304.
  - a. Use for exterior locations and where indicated.

## 2.7 MISCELLANEOUS MATERIALS

### A. Sill-Sealer Gaskets:

1. Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF STRUCTURAL COMPOSITE LUMBER

#### A. Install to comply with ESR report, manufacturer's written instructions, and applicable code.

1. Install in dry, covered conditions where average in-service moisture content of lumber is 16 percent or less.
2. Install metal framing connections in accordance with AWC's "National Design Specification (NDS) for Wood Construction." Install fasteners through each fastener hole.
3. Install lumber plumb and level. Accurately fit, align, securely fasten, and install free from distortion or defects.
4. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

#### B. Cutting: Confirm size and location of field cutting, notching, and drilling with ESR report, registered design professional, and manufacturer.

### 3.2 INSTALLATION OF PREFABRICATED WOOD I-JOISTS

#### A. Install to comply with ESR report, manufacturer's written instructions, and applicable code.

1. Install in dry, covered conditions where in-service moisture content of wood does not exceed 16 percent.
2. Install metal framing connections in accordance with AWC's "National Design Specification (NDS) for Wood Construction." Install fasteners through each fastener hole.
3. Install joists with top and bottom flanges within 1/2 inch (12.7 mm) of true vertical alignment, and support ends of each member with not less than 1-3/4 inches (44.5 mm) for end bearing and 3-1/2 inches (76 mm) for intermediate bearings.
4. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

- 5. Provide lateral restraint at supports to prevent rotation, and along the compression flange of each joist.
- B. Cutting: Do not splice structural members between supports unless otherwise indicated.
- C. Engineered Rim Boards: Install at bearing walls perpendicular to and supported by I-joists that require full-depth blocking, or rim joists, at supports.
- D. Sill Sealer Gasket: Install to form continuous seal between sill plates and foundation walls.

### 3.3 INSTALLATION OF ENGINEERED RIM BOARDS

- A. Install at bearing walls perpendicular to and supported by I-joists that require full-depth blocking, or rim joists, at supports.
- B. Sill Sealer Gasket: Install to form continuous seal between sill plates and foundation walls.

END OF SECTION 061715