

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK:

- A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, and without limiting the generality thereof furnish and install the following:
  - 1. Wood framing, including joists, rafters, outriggers, scab-ons, headers, stringers, posts, studs, plates, truss bracing and similar members.
  - 2. Wood grounds, nailers, blocking and sleepers.
  - 3. Wood furring.
  - 4. Plywood roof and wall sheathing.
  - 5. Miscellaneous carpentry as indicated or required and not specified under other Sections of the Specifications.
  - 6. Fasteners and accessories as indicated and required for rough carpentry.
  - 7. Treated wood as specified.
- B. Related Work Specified Elsewhere:

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1. Finish carpentry: Section 06200.
2. Prefabricated wood trusses: Section 06190.
3. Metal studs: Section 05400.
4. Gypsum wall sheathing: Section 09250.
5. Underlayments: Division 7
6. Furnishing and installing of doors and frames: Division 8.

1.03 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of the latest edition of the following except where more stringent requirements are shown or specified:
1. ANSI/AF&PA (American Forest & Paper Association) – NDS National Design Specification for Wood Construction – Latest Edition
  2. AHA (American Hardboard Association) A135.4 – Basic Hardboard.
  3. ALSC (American Lumber Standards Committee) – Softwood Lumber Standards.
  4. ANSI A208.1 – Mat-Formed Wood Particleboard.
  5. APA (American Plywood Association).
  6. AWPA (American Wood Preservers Association) C1-All Timber Products – Preservative Treatment by Pressure Process.
  7. AWPA (American Wood Preservers Association) C20-Structural Lumber Fire Retardant Treatment by Pressure Process.
  8. NELMA (New England Lumber Manufacturer’s Association).
  9. NFPA (National Forest Products Association).
  10. SPIB (Southern Pine Inspection Bureau).
  11. WCLIB (West Coast Lumber Inspection Bureau).

12. WWPA (Western Wood Products Association).
13. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

#### 1.04 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned to the Architect within 10 working days.
- D. Incomplete submittals will not be reviewed.
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in sections Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.
- G. Panel Drawings: This project is design to be field constructed. If the contractor elects to use prefabricated wall, floor and/or roof panels, the panels shall meet or exceed the framing designed in the construction documents, and applicable code requirements. Review by the Architect and Engineer of panel shop drawings shall be performed at the contractor's expense.
- H. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
  1. Engineered Wood Products
  2. Pressure Treated Lumber

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3. Fire Treated Lumber and/or Plywood
  - a. Include physical properties of the treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D5516 and ASTM D5664.
  - b. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment.
  - c. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
4. Sheathing
5. Samples of Exposed to View Wood Members: Submit two samples, 6 inches long, illustrating wood grain, stain, and finish.
6. Hangers, Hardware and Accessories

#### 1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with the following agencies:
  1. Lumber Grading Agency: Certified by NELMA.
  2. Plywood Grading Agency: Certified by APA.
- B. Grading stamp shall be on lumber and plywood.
- C. In lieu of grade stamping for exposed to view lumber and plywood, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

#### 1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Protect materials from warping or other distortion by stacking to resist movement.

- B. Follow manufacturer's recommendations for storage of Engineered Wood Products and connection hardware.

## PART 2 PRODUCTS

### 2.01 LUMBER MATERIALS

- A. Lumber, General: Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
- B. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
  - 1. Provide dressed lumber, S4S, unless otherwise indicated.
  - 2. Provide seasoned lumber with 19% maximum moisture content at time of dressing.
- C. For structural framing (4" and wider and from 2" to 4" thick), provide the following grade and species:
  - 1. Spruce-Pine-Fir (SPF) #1/2 or better, unless noted otherwise on Structural Drawings, Fire Retardant Treated where noted here within.
  - 2. Pressure treated lumber: Southern Yellow Pine #2 or better.
  - 3. See structural drawings for grades and bending stress at specific locations.
- D. Miscellaneous Lumber: Provide wood for support or attachment of other work including cant strips, bucks, nails, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
  - 1. Moisture content: 19% maximum for lumber items not specified to receive wood preservative treatment.
  - 2. Grade: Construction Grade light framing size lumber of any species or board size lumber as required. Provide construction grade boards (NELMA, or WCLB) or No.2 boards (SPIB, NELMA, or WWPA).

### 2.02 SHEATHING LOCATIONS

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- A. Roof Sheathing: APA rated, CDX, 5/8 inch thick, 48 x 96 inch sized sheets, square edges, unless noted.
- B. Floor Sheathing: APA rated, CDX, 3/4 inch thick, 48 x 96 inch sized sheets, tongue and groove.
- C. Wall Sheathing: APA rated, CDX, 1/2 inch thick, 48 x 96 inch sized sheets, square edges.
- D. Wall Sheathing at Shear Walls: APA Rated Structural I, 48 x 96 inch sheets, square edges, unless noted otherwise.
- E. Sheathing shall be Fire Retardant Treated where noted here within.
- F. Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels where required per Code requirements. Paint as required by electrical code.

## 2.03 ENGINEERED WOOD PRODUCTS

- A. General: Provide engineered wood products acceptable to authorities having jurisdiction and for which, current model code research or evaluation reports exist that evidence compliance with building code in effect for Project. Provide depths and widths as indicated.
  - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.
  - 2. Source and Species: Unless otherwise indicated, lumber sources in Engineered Wood Products shall be of single source and species.
  - 3. Adhesives shall be exterior type, complying with ASTM D2559.
  - 4. Substitutions: Substitutions of Engineered Wood Products other than those specified will be permitted only with written certification from the manufacturer that the substituted items "meets or exceeds" all properties of the specified product, including engineering, serviceability, aesthetic and durability characteristics. Substitutions shall not be made without written approval of the

Architect and Engineer.

- B. Laminated-Veneer Lumber (LVL): Lumber manufactured by laminating wood veneers in a continuous press using an exterior-type adhesive complying with ASTM D 2559 to produce members with grain of veneers parallel to their lengths and complying with the following requirements:

Boise Cascade	$F_b = 3080 \text{ psi}, E = 2.0 \times 10^6$
Trust Joist MacMillan.	$F_b = 2600 \text{ psi}, E = 1.9 \times 10^6$

- C. Parallel-Strand Lumber (PSL): Lumber manufactured by laying up wood strands using an exterior-type adhesive complying with ASTM D 2559, and cured under pressure to produce members with grain of strands parallel to their lengths and complying with the following requirements:

Trus Joist MacMillan	$F_{cII} = 2,900 \text{ psi}, F_b = 2900 \text{ psi}, E = 2.0 \times 10^6$
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- D. I-Joists: Meet manufacturer's standards for all properties and stiffness, for I-Joist series indicated.

Boise Cascade: BCI Series, as indicated on the drawings
Trus Joist MacMillan: TJI Series, as indicated on the drawings

- E. Laminated Strand Lumber (LSL): Lumber manufactured by laying up wood strands using an exterior-type adhesive complying with ASTM D 2559, and cured under pressure to produce members with laminations of strands parallel to their lengths and complying with the following requirements:

Trus Joist MacMillan: $F_b = 1,700 \text{ psi}, E = 1.3 \times 10^6$ (depths to 8 5/8")
$F_b = 1,700 \text{ psi}, E = 1.7 \times 10^6$ (depth 9 1/4" and up)

## 2.04 ACCESSORIES

- A. Fasteners, Anchors, Connectors and Hardware:

1. Fasteners (for wood framing): Nail fasteners shall meet requirements of ASTM F1667.
2. Anchor Bolts: ASTM A307 headed and SSTB Anchor Bolts by Simpson StrongTie, unless noted otherwise.

3. Screw fasteners (where indicated on drawings or required to install connection hardware):
    - a. SD & SDS Screws by Simpson Strong Tie
    - b. RSS Screws by GRK Fasteners
    - c. Wood Screws: ANSI/ASME Standard B18.6.1
  4. Lag Screws: ANSI/ASME Standard B18.2.1. Provide lead hole per NDS Chapter 11.
  5. Through Bolts: ANSI/ASME Standard B18.2.1:
    - a. Holes for through bolts shall be a minimum of 1/32nd and a maximum of 1/16th larger than bolt diameter.
    - b. A standard cut washer shall be provided between the wood and bolt head, and wood and nut, unless noted otherwise.
- B. Structural Framing Connectors, Hardware or Joist Hangers: As indicated on the drawings or sized to suit framing conditions, manufactured by Simpson or approved alternate.
1. Unless noted, fill all nail holes to achieve manufacturer's maximum reaction rating.
  2. Use nail diameter and length as specified by connector manufacturer. Substitutions of pneumatic nails or "joist hanger" (non standard length) nails shall not be made without written authorization of the Engineer.
- C. Construction Adhesive: APA AFG-01, approved for use with type of construction panel indicated by both adhesive and panel manufacturer.
- D. ALL ANCHORS, CONNECTORS AND FASTENERS IN CONTACT WITH PRESSURE TREATED LUMBER, FIRE RETARDANT TREATED LUMBER AND/OR AT EXTERIOR EXPOSURE SHALL HAVE COATINGS AS FOLLOWS, UNLESS NOTED OTHERWISE:
1. Anchor Bolts/Bolts/Lag Bolts: Hot Dipped Galvanized, ASTM A123
  2. Connection Hardware, unless otherwise noted: Simpson Strongtie Z-Max (G185 per ASTM A653) or Hot Dipped Galvanized (HDG, ASTM A123). Use hot dipped galvanized fasteners, ASTM A153 with these hangers.



3. Nails and Fasteners, unless otherwise noted: Hot Dipped Galvanized, ASTM A153.
4. Fasteners used in conjunction with Fire Retardant Lumber shall be coated per the manufacturer's recommendations. Some Fire Retardants may require the use of stainless steel fasteners. If the manufacturer has no specific recommendation, provide Hot Dipped Galvanized fasteners, ASTM A153.
5. Proprietary coatings used in conjunction with pressure treated fastener coatings will be permitted with written permission from the Architect and Engineer.

## 2.05 FACTORY WOOD TREATMENT

### A. PRESSURE TREATED LUMBER (P. T.)

1. Wood Preservative (Pressure Treatment): AWWA Treatment, ACQ-C (amine formulated), ACQ-D or CA-B, ammonia free.
2. The use of ACZA and CCA treated lumber is strictly prohibited.
3. Retention:
  - a. Above Ground Use: ACQ: 0.25 pcf, CA-B: 0.10 pcf
  - b. Ground Contact Use: ACQ: 0.40 pcf, CA-B: 0.21 pcf.
4. See Section the "Fasteners, Anchors, Connectors and Hardware" portion of this specification for fastener, anchor and hardware requirements for use with pressure treated lumber.
5. Pressure treated lumber shall not contain ammonia unless authorized by the Architect and Engineer. Ammonia content shall be verified with the Pressure Treatment manufacturer.

### B. FIRE RETARDANT TREATED LUMBER:

1. Fire retardant treated lumber shall meet the specifications of the AWWA C20/C27, Interior Type A Fire Retardant, TP Monitored STD DB 90.

- a. Product: D-Blaze by Chemical Specialties, Inc, Charlotte, NC
  - b. Substitutions are subject to written approval from the Engineer, and Architect and/or Building Code Official.
2. The following shall be Fire Retardant Treated:
- a. All lumber in the exterior bearing walls of Building 2, including but not limited to, studs, headers, trimmers, jack studs, king studs, plates, sills and blocking.
  - b. Wall Sheathing at the Exterior Bearing Walls of Building 2.
3. Fire retardant treated lumber shall be re-dried after treatment in accordance with AWPA Standards C20. Allowable values must be adjusted in accordance with NDS. Lumber treater shall supply certificate of compliance.

## PART 3 EXECUTION

### 3.01 FRAMING

- A. Set members level and plumb, in correct position.
- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Place horizontal members, crown side up.
- D. Construct load bearing framing members full length without splices.
- E. Double members at openings over 24 inches wide. Space short studs over and under opening to stud spacing.
- F. Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.
- G. Coordinate installation of wood decking, and prefabricated wood trusses.
- H. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

- I. Coordinate curb installation with installation of decking and support of deck openings, and roofing vapor retardant.
- J. Rough Carpentry Fastening Schedule: Unless otherwise indicated on the drawings, provide minimum nailing and fastening per IBC Table 2304.9.1.

### 3.02 SHEATHING

- A. Secure roof sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing provide gap between panels as recommended by manufacturer. Utilize H-clips at panel edges per manufacturer's recommendations or as indicated. Provide blocking where indicated on the Drawings.
- B. Secure floor sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing. Secure tongue in groove per manufacturers instructions. Glue and nail/screw as indicated. Provide blocking where indicated on the Drawings. Floor sheathing shall be laid out in a manner to prevent squeaks.
- C. Secure wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered.
- D. Install telephone and electrical panel backboards with plywood sheathing material where required. Size as indicated or 6 inch larger than panel space required.

### 3.03 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.

**END OF SECTION**