

SECTION 06100 - ROUGH CARPENTRY

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing rough carpentry for the following applications:
 - 1. Wood framing with plates, studs, joists, rafters, purlins, and similar framing elements.
 - 2. Wood blocking, furring, stripping, backing, and nailers, as indicated, or otherwise required for securing other WORK.
 - 3. Plywood sheathing, board sheathing, sidings and starter boards.
 - 4. Rough hardware appurtenances to the WORK of this Section.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 03100 Concrete Formwork
 - 2. Section 03300 Cast-in-Place Structural Concrete
 - 3. Section 04231 Reinforced Brick Masonry
 - 4. Section 04232 Reinforced Concrete Block Masonry
 - 5. Section 05100 Structural Metal Framing
 - 6. Section 05500 Miscellaneous Metalwork

1.3 STANDARD SPECIFICATIONS

- A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the Standard Specifications for Public Works Construction (SSPWC), as specified in Section 01090 - REFERENCE STANDARDS.

1.4 CODES

- A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:
 - 1. Uniform Building Code

1.5 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:
 - 1. Fed. Spec. FF-B-561C Bolts, (Screw), Lag
 - 2. Fed. Spec. FF-B-575C Bolts, Hexagon and Square

3. Fed. Spec.
FF-B-584E(1) Bolts, Finned Neck; Key Head; Machine;
Ribbed Neck; Square Neck; Tee Head
4. Fed. Spec.
FF-B-588C(1) Bolt, Toggle: And Expansion Sleeve, Screw
5. Fed.Spec.
FF-N-105B(3)
Int.Amd. 4 Nails, Brads, Staples and Spikes; Wire, Cut,
and Wrought
6. Fed. Spec.
FF-N-836D(1) Nut: Square, Hexagon, Cap, Slotted, Castle,
Knurled, Welding and Single Ball Seat
7. Fed. Spec FF-S-111D Screw, Wood
8. Fed. Spec. FF-S-1362 Stud, Plain, General Purpose
9. U.S. Commercial Std.
CS-35 Pine Plywood
10. U.S. Commercial Std.
CS-253 Structural, Glue-Laminated, Timber
11. U.S. Product Std.
PS-1 Softwood Plywood
12. U.S. Product Std.
PS-58 Hardboard
13. AITC 104 Timber Construction Manual, Timber Construction
Details
14. AITC 105 Timber Construction Manual, Recommended Practice
for the Erection of Structural Timber Framing
15. ASTM D 226 Specification for Asphalt-Saturated Organic Felt Used in
Roofing and Waterproofing
16. AWPAC1 AWPAC Manual of Recommended Practice, Standard For
Preservative Treatment by Pressure Process--All Timber
Products
17. FPL Bulletin 1069 Forestry Products Laboratory Bulletin []
18. RIS Standard Specifications for Grades of California
Redwood Lumber by the Redwood Inspection Service
19. SPIB Grading Rules for Southern Pine Lumber of the Southern
Pine Inspection Bureau

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| 20. | UBC Std. 25-10 | Structural Glued-Laminated Timber |
| 21. | UBC Std. 25-12 | Preservative Treatment by Pressure Processes and Quality Control Standards |
| 22. | WCLIB | Standard Grading and Dressing Rules No. 16 of the West Coast Lumber Inspection Bureau |
| 23. | WWPA | Standard Grading Rules for Western Lumber, Western Wood Products Association |

1.6 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
1. Manufacturer's product data showing rough hardware.
 2. Engineering calculations for design of glue-laminated beams and wood trusses and joists, signed by a Registered Professional Engineer.
 3. Shop drawings for fabricated wood trusses and other fabricated structural members indicating materials, details of construction, methods of fastening, and erection details.

1.7 OWNER'S MANUAL

- A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:
1. Certificates of compliance.
 2. Certificate of conformance with U.S. Commercial Standard CS 253.
 3. Inspection report of independent inspection agency showing that products comply with applicable AWPA treatment standards. The Quality Mark "LP-22" on each piece will be accepted in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. **Delivery of Materials:** Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.
- B. **Storage:** Lumber shall be carefully stored in a manner that will prevent damage and in an area that is protected from the deleterious effects of the elements.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. **General:** Only lumber certified as complying with the indicated requirements shall be provided.
- B. **Products:** Lumber shall be new, of current manufacture, and shall be the products of reputable mills specializing in producing such lumber.
- C. **SSPWC Compliances:** Lumber and plywood shall comply with SSPWC Subsection 204-1 and this Section.

2.2 UNTREATED LUMBER

- A. **Grading:** Lumber shall be graded in accordance with the rules of one of the following associations: "Grading Rules for Southern Pine Lumber" of the Southern Pine Inspection Bureau; "Standard Grading and Dressing Rules No. 16" of the West Coast Lumber Inspection Bureau; or "Grading Rules for Western Lumber" published by Western Wood Products Association.
- B. **Grade Marking:** Each piece of lumber shall bear the indicated official grade mark.
- C. **Size Dressing:** Lumber, except as otherwise indicated, shall be dressed to size in accordance with the standards of the association under which the lumber is graded. Lumber shall be S4S unless otherwise indicated.
- D. **Drying:** Lumber incorporated in the WORK, except where otherwise indicated, shall be air or kiln dried to a moisture content of not more than [19] [] percent and not less than [1] [] percent.
- E. **Framing Lumber Grades:** Grades of framing lumber shall comply with the following:

<u>Use</u>	<u>[WCLIB] Grade</u>	<u>Grading Rule</u>	<u>StressF_b</u>
Rafters, joists, studs 2 x 6 and larger, miscellaneous framing, ledgers, etc.	[No. 1]	[Para. 123-b]	2050 psi rep.
Studs and plates 2 x 4 and 4 x 4	[Const.]	[Para. 112-b]	1200 psi rep.
Beams and Stringers	[Select.] [Struct.]	[Para. 130-a]	1600 psi
Posts and Timber	[No. 1] [Struct.]	[Para. 131-b]	1350 psi

2.3 REDWOOD

- A. Redwood shall conform to requirements of the "Standard Specifications for Grades of California Redwood Lumber" of the Redwood Inspection Service. Redwood lumber used for foundation plates or in contact with concrete shall be Foundation Grade, S4S.

2.4 TREATED LUMBER

- A. **SSPWC Compliance:** Lumber shall be treated with preservatives in compliance with SSPWC Subsection 204-2.1 and this Section.
- B. **Marking:** Each piece of treated lumber shall bear the approval mark of an approved testing agency.
- C. **Kiln Drying:** Kiln-dried lumber shall be treated with a water-borne preservative and shall have a maximum moisture content of 15 percent after treatment.
- D. **Pressure-Treated Lumber:** Wood nailing blocks, sills, and plates resting on or embedded in concrete or masonry within 18 inches of grade shall be pressure-treated in accordance with AWWA C1. Preservative shall conform to [UBC Standard 25-12] [American Wood Preservers Association and American Wood Preservers Bureau Standard Specifications]. Creosote shall not be used.
- E. **Preservative:** Two coats of preservative shall be applied at least 2 hours before installation, to surfaces which come in contact with, or are set close to concrete and plaster. Tank dipping or pressure-treating may be used.
- F. **Cuts:** Wherever necessary to cut, notch, dap, drill, or frame treated lumber, newly cut or bored surfaces shall be treated with 2 heavy coats of the same preservative used in the original treatment. The minimum penetration depth shall be 1/4-inch.
- G. **Fire-Retardant Treated Lumber:** Where required, fire-retardant treatment for lumber shall conform to the requirements of the indicated code.

2.5 PLYWOOD AND HARDBOARD

- A. **Plywood:** Plywood shall conform to the requirements of U.S. Product Standard PS-1. Plywood panels shall be marked with grade mark of the American Plywood Association. The mark shall identify the plywood as to species, glue type, and grade and shall comply with the applicable commercial standards. Except as otherwise indicated, plywood shall be [Douglas Fir, Exterior, C-D, S1S] []. Plywood for other specific applications shall comply with the following:
 1. Plywood for use in concrete forms shall conform to the requirements of Section 03100.
 2. Plywood for back-up boards behind telephone equipment, electrical equipment, or communication equipment shall be Douglas Fir, A-C INT grade for interior locations and A-C-EXT for exterior locations.
 3. Plywood tool boards and protective wall paneling shall be Douglas Fir N-D-INT grade.

4. Plywood siding shall be exterior type, [303 Siding] [T-111] [] Ext. Grade, of []-inch thickness, with [] veneer and [] face texture [or grooves].

B. **Hardboard:** Hardboard shall be temper-treated panels manufactured from interfelted ligno-cellulose fibers consolidated under heat and pressure in a hot press to produce a smooth, hard-surfaced material which is resistant to water and stains. Hardboard shall conform to the requirements of PS-58.

2.6 ROUGH HARDWARE

A. **General:** The term "rough hardware" includes nails, screws, lag screws, bolts, nuts, washers, plates, metal fasteners, framing anchors, anchor bolts which are to be embedded into concrete, concrete masonry, or brick masonry, and similar items employed in erection and construction of the rough carpentry work. Rough hardware shall be of standard manufacture and shall be approved by a recognized agency for the intended applications. Unless otherwise indicated, hardware items shall be steel, hot-dip galvanized after fabrication, and shall comply with Section 05100 and Section 05500.

B. **Anchors and Fasteners:** Anchors and fasteners for securing wood items, unless otherwise indicated, shall comply with the following:

1. Bolts, nuts, and studs shall conform to the requirements of Federal Specifications FF-B-584E(1), FF-N-836D(1), FF-S-1362, and FF-B-575C, and Section 05500.

2. Nails and staples shall conform to Federal Specification FF-N-105B(3) Int. Amd. 4, and shall be the type and size best suited for the intended application. Nails shall be galvanized steel, aluminum, or stainless steel, as appropriate, where exposed to weather. Nails used for fastening plywood to nailers on steel beams shall be short nails of wire gauge as indicated. Nails used for exterior (exposed to view) plywood siding, siding, or trim shall be stainless steel.

3. Wood screws shall conform to the requirements of Federal Specification FF-S-111D for the style and material indicated. Wood screws shall be galvanized where exposed to view or to weather.

4. Lag screws or lag bolts shall conform to the requirements of Federal Specification FF-B-561C for the type and grade best suited for the purpose. Lag screws or lag bolts shall be galvanized where exposed to view or weather.

5. Toggle bolts shall conform to the requirements of Federal Specification FF-B-588C(1) for the type and grade best suited for the purpose.

6. Expansion shields shall comply with Section 05500.

7. Power-driven pins shall comply with Section 05500.

C. **Metal Framing Devices:** Metal framing devices shall be specially-designed joist hangers, header hangers, framing anchors, post anchors, and structural framing connectors fabricated from steel and hot-dip galvanized after fabrication. The framing devices shall be equal or superior to indicated requirements for design, friction, and loading. Framing devices shall

include properly sized nails, bolts, lag bolts, or other fasteners required by design calculations for the framing.

- D. **Plate/Sill Material:** Plates and sills shall be foundation grade redwood or Douglas fir, pressure-treated with a water-borne preservative complying with the requirements of AWWA Standard P5 and AWWA C1.
- E. **Plyclips:** Plyclips shall be extruded aluminum clips, manufactured from 6063-T6 aluminum alloy, and designed and sized for intended use.

2.7 MISCELLANEOUS PRODUCTS

- A. **Building Paper:** Building paper or felt shall be non-perforated, asphalt-saturated organic felt conforming to ASTM D 226, 15 lb/100 sq ft.
- B. **Termite Shields:** Termite shields shall be not less than 26-gauge, zinc-coated steel or 30-gauge, terne steel coated with 40 lb of coating material per 100 square feet.

2.8 GLUE-LAMINATED MEMBERS

- A. **Glue-Laminated Timbers:** Glue-laminated wood timbers shall comply with the requirements of [U.S. Commercial Standard CS-253 and Forestry Products Laboratory Bulletin 1069,] [UBC Standard No. 25-10] and shall conform to the American Institute of Timber Construction requirements.
- B. **Glue-Laminated Beams:** Glue-laminated beams shall comply with the following:
 - 1. Glue-laminated wood beams shall be AITC ["Industrial Appearance Grade"] ["Architectural Appearance Grade"] ["Premium Grade"], [S4S.] [S3S.] and shall bear the mark of the American Institute of Timber Construction.
 - 2. Glue-laminated beams shall be continuous unless otherwise indicated and shall include arches and/or curves as indicated or required.
 - 3. Lumber for glue-laminated wood beams shall be Coast Region Douglas Fir complying with CS-253 and shall be stress graded for combination 24F in compliance with the Uniform Building Code, [], [dry] [wet] condition of use. Thicknesses of lumber for laminations shall comply with standard practice of the manufacturer.
 - 4. Adhesives shall conform to CS-253 requirements for wet use beams.
 - 5. Beams shall be coated with sealer and shall be [load] [individual] wrapped for shipment to the project site.

2.9 MANUFACTURERS

- A. **Manufacturers:** Products of the type indicated shall be manufactured by one of the following (or equal):
 - 1. Preservatives:

Zehrung "Pentaseal"
Sherwin Williams, "Kemwood Penta"

2. Metal Framing Devices:

Silver Metal Products, Inc.
Easy Ardes Rib, Simpson Co.
Heckmanor Building Products
Harlen Metal Products, Inc.

PART 3 -- EXECUTION

3.1 GENERAL

- A. **Verification:** The WORK of this Section includes verification of drawing dimensions with actual field conditions and inspection of related work and adjacent surfaces, and reporting of conditions preventing proper execution of the WORK of this Section.
- B. **Rough Hardware:** The WORK of this Section includes rough hardware, not otherwise indicated, and which is necessary for proper framing, including nails, spikes, dowels, fasteners, and similar items.
- C. **Framing:** Framing members and assemblies shall be closely fitted, accurately set, and rigidly secured to required lines, levels, and arrangements indicated. Framing shall be accurately and neatly cut and shall be securely nailed, spiked, or otherwise fastened in place in a workmanlike manner. Timber connectors and installation shall conform to requirements of AITC 104 and AITC 105.

3.2 FASTENERS AND FRAMING DEVICES

- A. **Nailing:** Except as otherwise indicated, nails shall not be driven closer together than 1/2 their length unless driven in drilled holes, nor driven closer to the edge of a member than 1/4 of their length. When necessary to prevent splitting, holes shall be drilled slightly smaller than nail diameters. Common nails shall be used unless otherwise indicated.
- B. **Bolts and Nuts:** Malleable or cut-steel washers shall be provided under bolt heads and nuts except where bearing on steel plates or other steel attachments or where flat-head countersunk bolts are shown. Bolt holes shall be drilled 1/32-inch to 1/16-inch larger diameter than the bolts they are to accommodate, and shall be bored true-to-line. Members shall be clamped together and bolts shall be secured in place and nuts shall be drawn up tightly. Bolts shall be tightened again immediately prior to enclosing with finish or, if left exposed, upon completion of other WORK. Holes at anchor bolts embedded in concrete may be 1/16-inch larger than bolt diameter.
- C. **Screws:** Holes to receive lag screws shall be bored first of the same diameter and depth as shank, then continued to depth equal to length of screw with diameter equal to the base of the screw thread. Screws shall penetrate into the farther member a distance equal to at least 7 times the diameter of the screw shank. Washers shall be installed under each lag screw head bearing on wood.

- D. **Metal Framing Devices:** Metal framing devices shall be installed where shown. Nails for the framing devices shall be furnished or recommended by the manufacturer of the anchor device. Nails shall be driven to full depth at all holes in anchors. Bolt and lag fasteners shall be drawn tight.

3.3 FRAMING

- A. **Strength Considerations:** Structural wood framing members shall not be spliced between bearing points or supports. Due care shall be exercised in placing framing so that structural and other important members do not require cutting for openings, pipes, vents, conduits, or ducts. Bearing surfaces on which wood structural members are to rest shall be finished to give full, true, and even support. Wedges or shims shall not be used to correct faulty work. Wood members which have been split or otherwise damaged shall be removed and replaced.
- B. **Cutting and Notching:** Skilled workmen shall be used for all cutting and framing of wood members required to accommodate structural members, routing of piping, conduit, ducts, and the installation of mechanical, electrical, or other apparatus or equipment. Members shall not be cut, notched, nor bored more than 1/4 of their depth without proper reinforcing.
- C. **Plate and Sill Installation:** Bottom plates and sill plates which are secured to concrete shall be located as indicated. The anchor bolts shall be located as indicated or as required. The plates and sills shall be leveled with shims. Washers shall be installed and nuts shall be tightened to level bearing, after which the space (1/2-inch minimum) between the sill and concrete shall be dry-packed with cement grout complying with Section 03300.
- D. **Wall Framing:** Studs shall be installed at a spacing of 16 inches on centers unless otherwise indicated. A single plate shall be provided at the bottom, and a double plate at the top of wall framing unless otherwise shown. Joints in upper and lower members of the top plate shall be staggered not less than 4 feet. Stud walls and partitions shall have a continuous row of blocking or firestopping which shall form a complete and effective separation for the entire width of the wall or partition. Blocking shall be located so that there will be no concealed air spaces greater than 7 ft in horizontal or vertical dimension. Defective materials, including crooked, warped, or bowed materials shall be replaced.
- E. **Blocking and Backing:** Except as otherwise indicated, blocking and backing in walls and ceilings shall be nominal 2-inch thick material of a depth as needed and shall be accurately located around light fixtures, ceiling registers, grilles, plumbing fixtures, and other mechanical and electrical items, wherever required. Blocking shall fit snugly and shall be spiked into the supporting framing members. Wood blocking (backing) to receive sheathing, siding, metal lath, and gypsum board shall be installed wherever necessary for securing the facing materials.
- F. **Backing for Specialties and Accessories:** Backing shall be accurately located and installed for all building specialties, toilet accessories, and finish hardware items.
- G. **Concrete-Embedded Blocks:** Where indicated, nominal 2-inch thick nailing blocks (dovetail type) shall be installed in concrete to receive superimposed wood stripping, grounds, and backing. Applied grounds or stripping shall be securely nailed into wood nailing blocks.
- H. **Furring:** Furring shall be 2-inch by 3-inch wood studs spaced at 16 inches on center, laid flat to the wall. Light metal framing may be substituted in compliance with Section 05500.

- I. **Rafters and Joists:** Rafters and joists shall be placed crown up and supported firmly on the framing below. Care shall be used in selection and placing of members. Positive and secure attachment shall be provided. Double joists and double headers shall be provided to receive trimmers at openings which cut or interrupt normal rafter spacing.
- J. **Roofs:** Roofs shall be erected level or shall be sloped as indicated.
- K. **Plywood Siding:** Plywood siding shall be applied in accordance with the manufacturer's published recommendations and the American Plywood Association standards.
- L. **Plywood Sheathing:** Plywood sheathing shall be installed with face grain across supports and end joints shall be over joists and shall be staggered. Blocking shall be provided at all unsupported edges.
- M. **Fire Stops:** Fire stops shall be not less than 2-inch nominal thickness and of the same width as the studs. Strips of full-thickness fiber glass or rock wool shall be installed around pipes, ducts, conduits, and other penetrations through fire stops.
- [N. **Sleepers:** Locations and sizes of sleepers for mechanical equipment and curb openings shall be verified prior to installation. Sleepers shall be ripped to conform to roof slope if necessary.]
- [O. **Sand Blasting:** Members required to be sandblasted shall be lightly sandblasted.]

** END OF SECTION **