

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Wood furring, grounds, nailers, and blocking.
 - 4. Sheathing.
 - 5. Underlayment.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Metal-Plate-Connected Wood Trusses."
 - 2. Division 6 Section "Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.

1.3 DEFINITIONS

- A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.
- B. Exposed Framing: Dimension lumber not concealed by other construction and indicated to receive a stained or natural finish.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for the following products:
 - 1. Engineered wood products.
 - 2. Underlayment.
 - 3. Insulating sheathing.
 - 4. Air-infiltration barriers.
 - 5. Metal framing anchors.
 - 6. Construction adhesives.

- C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.
- D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
 - 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
 - 2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
 - 3. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.
- E. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.
- F. Warranty of chemical treatment manufacturer for each type of treatment.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- B. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.
- C. Single-Source Responsibility for Fire-Retardant-Treated Wood: Obtain each type of fire-retardant-treated wood product from one source and by a single producer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wood-Preservative-Treated Materials:
 - a. Baxter: J. H. Baxter Co.
 - b. Chemical Specialties, Inc.
 - c. Continental Wood Preservers, Inc.
 - d. Hickson Corp.
 - e. Hoover Treated Wood Products, Inc.
 - f. **Osmose Wood Preserving, Inc.**
2. Fire-Retardant-Treated Materials, Interior Type A:
 - a. Baxter: J. H. Baxter Co.
 - b. Chemical Specialties, Inc.
 - c. Continental Wood Preservers, Inc.
 - d. Hickson Corp.
 - e. Hoover Treated Wood Products, Inc.
3. Fire-Retardant-Treated Materials, Exterior Type:
 - a. American Wood Treaters, Inc.
 - b. Hoover Treated Wood Products, Inc.
4. Laminated-Veneer Lumber:
 - a. Alpine Structures.
 - b. Boise Cascade Corp.
 - c. Georgia-Pacific Corp.
 - d. Louisiana-Pacific Corp.
 - e. Trus Joist MacMillan.
 - f. Willamette Industries, Inc.
5. Parallel-Strand Lumber:
 - a. Alpine Structures.
 - b. Trus Joist MacMillan.
6. Gypsum Sheathing Board:
 - a. Domtar Gypsum.
 - b. Georgia-Pacific Corp.
 - c. **National Gypsum Co.; Gold Bond Building Products Division.**
 - d. United States Gypsum Co.
7. Glass-Fiber-Surfaced Gypsum Sheathing Board:
 - a. Georgia-Pacific Corp.
 - b. United States Gypsum Co.
8. Extruded Cellular Polystyrene Sheathing:
 - a. Amoco Foam Products Co.
 - b. Dow Chemical Company (The).
 - c. UC Industries, Inc.

9. Air-Infiltration Barriers:

- a. Amoco Foam Products Co.
- b. Anthony Industries, Inc.; Simplex Products Division.
- c. Celotex Corporation (The); Building Products Division.
- d. DuPont Company; Fibers Department.
- e. Parsec, Inc.
- f. Raven Industries, Inc.
- g. Reemay, Inc.
- h. Sto-Cote Products, Inc.

10. Metal Framing Anchors:

- a. Cleveland Steel Specialty Co.
- b. Harlen Metal Products, Inc.
- c. Silver Metal Products, Inc.
- d. Simpson Strong-Tie Company, Inc.**
- e. Southeastern Metals Manufacturing Co., Inc.

2.2 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA - Northeastern Lumber Manufacturers Association.
 - 2. NLGA - National Lumber Grades Authority (Canadian).
 - 3. RIS - Redwood Inspection Service.
 - 4. SPIB - Southern Pine Inspection Bureau.
 - 5. WCLIB - West Coast Lumber Inspection Bureau.
 - 6. WWPAA - Western Wood Products Association.
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.
- D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 1. Provide dressed lumber, S4S, unless otherwise indicated.
 - 2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.
 - 3. Provide lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
 - 1. Do not use chemicals containing chromium or arsenic.
 - 2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches (460 mm) above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).
- D. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.4 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.
 - 2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Interior Type A: For interior locations, use chemical formulation that produces treated lumber and plywood with the following properties under conditions present after installation:
 - 1. Bending strength, stiffness, and fastener-holding capacities are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions simulating installed conditions when tested by a qualified independent testing agency.
 - 2. No form of degradation occurs due to acid hydrolysis or other causes related to treatment.
 - 3. Contact with treated wood does not promote corrosion of metal fasteners.
- C. Exterior Type: Use for exterior locations and where indicated.
- D. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

2.5 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species:
1. Grade: Construction, Stud, or No. 3.
 2. Grade: Standard, Stud, or No. 3.
 3. Species: Eastern softwoods; NELMA.
 4. Species: Spruce-pine-fir south; NELMA.
 5. Species: Hem-fir north; NLGA.
 6. Species: Spruce-pine-fir north; NLGA.
 7. Species: Northern species; NLGA.
 8. Species: Southern pine; SPIB.
 9. Species: Mixed southern pine; SPIB.
 10. Species: Hem-fir; WCLIB or WWPA.
 11. Species: Spruce-pine-fir south; WCLIB or WWPA.
 12. Species: Western woods; WCLIB or WWPA.
 13. Species: Any species above.
- C. Exterior and Load-Bearing Walls: Provide framing of the following grade and species:
- D. Framing Other than Non-Load-Bearing Partitions: Provide framing of the following grade and species:
1. Grade: No. 2.
 2. Grade: Construction or No. 2.
 3. Grade: Construction, Stud, or No. 3.
 4. Species: Spruce-pine-fir south; NELMA.
 5. Species: Douglas fir-larch north; NLGA.
 6. Species: Hem-fir north; NLGA.
 7. Species: Spruce-pine-fir north; NLGA.
 8. Species: Southern pine; SPIB.
 9. Species: Mixed southern pine; SPIB.
 10. Species: Douglas fir-larch; WCLIB or WWPA.
 11. Species: Hem-fir; WCLIB or WWPA.
 12. Species: Douglas fir south; WWPA.
 13. Species: Any species above.
 14. Species and Grade: Any species of machine stress-rated (MSR) dimension lumber with a grade of 1450f-1.3E.
 15. Species and Grade: Any species of machine stress-rated (MSR) dimension lumber with a grade of 1800f-1.6E.
- E. Ceilings (Non-Load-Bearing): For ceiling framing that does not support a floor, roof, or attic, provide the following grade and species:
1. Grade: No. 2.
 2. Grade: Construction or No. 2.
 3. Grade: Construction, Stud, or No. 3.
 4. Species: Spruce-pine-fir south; NELMA.
 5. Species: Douglas fir-larch north; NLGA.
 6. Species: Hem-fir north; NLGA.
 7. Species: Spruce-pine-fir north; NLGA.
 8. Species: Southern pine; SPIB.

9. Species: Mixed southern pine; SPIB.
10. Species: Douglas fir-larch; WCLIB or WWPA.
11. Species: Hem-fir; WCLIB or WWPA.
12. Species: Douglas fir south; WWPA.
13. Species: Any species above.

F. Other Framing Not Listed Above: Provide the following grades and species:

1. Grade: Select Structural.
2. Grade: No. 1.
3. Grade: No. 2.
4. Grade: Construction or No. 2.
5. Grade: Construction, Stud, or No. 3.
6. Species: Douglas fir-larch north; NLGA.
7. Species: Hem-fir north; NLGA.
8. Species: Southern pine; SPIB.
9. Species: Douglas fir-larch; WCLIB or WWPA.
10. Species: Hem-fir; WCLIB or WWPA.
11. Species: Douglas fir south; WWPA.
12. Species: Any species above.
13. Species and Grade: Any species of machine stress-rated (MSR) dimension lumber with a grade of 1450f-1.3E.
14. Species and Grade: Any species of machine stress-rated (MSR) dimension lumber with a grade of 1800f-1.6E.
15. Species and Grade: Any species and grade with a modulus of elasticity of at least 1,300,000 psi (8950 MPa) and an extreme fiber stress in bending of at least 850 psi (5.9 MPa) for 2-inch nominal (38 mm-actual) thickness and 12-inch nominal (286-mm actual) width for single member use.

G. Exposed Framing: Provide material hand-selected from lumber of species and grade indicated below for uniformity of appearance and freedom from characteristics that would impair finish appearance.

1. Species and Grade: As indicated above for load-bearing construction of same type.
2. Species and Grade: Spruce-pine-fir south, Select Structural; NELMA, WCLIB, or WWPA.
3. Species and Grade: Hem-fir north, Select Structural; NLGA.
4. Species and Grade: Spruce-pine-fir north, Select Structural; NLGA.
5. Species and Grade: Redwood, Clear Heart Structural; RIS.
6. Species and Grade: Redwood, Clear Structural; RIS.
7. Species and Grade: Southern pine, Select Structural; SPIB.
8. Species and Grade: Hem-fir, Select Structural; WCLIB or WWPA.

2.6 BOARDS

A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:

1. Moisture Content: 19 percent maximum.
2. Moisture Content: 15 percent maximum.
3. Species and Grade: Eastern white pine, D Select per NELMA or NLGA rules.
4. Species and Grade: Redwood, Clear per RIS rules.
5. Species and Grade: Southern pine, C Finish per SPIB rules.
6. Species and Grade: Hem-fir, C & Btr per WCLIB rules or C Select per NLGA or WWPA rules.
7. Species and Grade: Spruce-pine-fir, C & Btr per WCLIB rules or C Select per NLGA or WWPA rules.

8. Species and Grade: Western or Idaho white pine, Choice per NLGA or WWPA rules.
9. Species and Grade: Western red cedar, A grade per NLGA or WWPA rules.

B. Concealed Boards: Where boards will be concealed by other work, provide lumber with 19 percent maximum moisture content and of following species and grade:

1. Species and Grade: Eastern softwoods, No. 3 Common per NELMA rules.
2. Species and Grade: Northern species, No. 3 Common or Standard per NLGA rules.
3. Species and Grade: Mixed southern pine, No. 2 per SPIB rules.
4. Species and Grade: Hem-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
5. Species and Grade: Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
6. Species and Grade: Western woods, Standard per WCLIB rules or No. 3 Common per WWPA rules.
7. Species and Grade: Any species above.

2.7 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.8 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.
 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.
- B. Laminated-Veneer Lumber: 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:
 1. Extreme Fiber Stress in Bending: 2500 psi (17 MPa) for 12-inch nominal- (286-mm actual-) depth members.
 2. Modulus of Elasticity: 2,000,000 psi (13 800 MPa).
 3. Tension Parallel to Grain: 1850 psi (13 MPa).
 4. Compression Parallel to Grain: 2800 psi (19 MPa).
 5. Compression Perpendicular to Grain: 400 psi (3 MPa) perpendicular to and 500 psi (3.5 MPa) and parallel to glue line.

6. Horizontal Shear: 285 psi (2 MPa) perpendicular to and 190 psi (1.3 MPa) parallel to glue line.
- C. Parallel-Strand Lumber: 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:
1. Extreme Fiber Stress in Bending: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
 2. Modulus of Elasticity: 2,000,000 psi (13 800 MPa).
 3. Tension Parallel to Grain: 2400 psi (16.5 MPa).
 4. Compression Parallel to Grain: 2900 psi (20 MPa).
 5. Compression Perpendicular to Grain: 400 psi (3 MPa) perpendicular to and 600 psi (4.1 MPa) and parallel to wide face of strands.
 6. Horizontal Shear: 210 psi (1.4 MPa) perpendicular to and 290 psi (2 MPa) and parallel to wide face of strands.

2.9 WOOD-BASED STRUCTURAL-USE PANELS, GENERAL

- A. Structural-Use Panel Standards: Provide either all-veneer, mat-formed, or composite panels complying with DOC PS 2, "Performance Standard for Wood-Based Structural-Use Panels," unless otherwise indicated. Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood," where plywood is indicated.
- B. Structural-Use Panel Standard: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."
- C. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

2.10 CONCEALED, PERFORMANCE-RATED STRUCTURAL-USE PANELS

- A. General: Where structural-use panels are indicated for the following concealed types of applications, provide APA-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).
 1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.
 2. Span Ratings: Provide panels with span ratings required to meet "Code Plus" provisions of APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial."
- B. Combination Subfloor-Underlayment: APA-rated Sturd-I-Floor.
 1. Exposure Durability Classification: Exterior.
 2. Exposure Durability Classification: Exposure 1.
 3. Span Rating: As required to suit joist spacing indicated.
 4. Span Rating: Single Floor - 16.
 5. Span Rating: Single Floor - 20.
 6. Span Rating: Single Floor - 24.
 7. Span Rating: Single Floor - 32.
 8. Span Rating: Single Floor - 48.
 9. Edge Detail: Square.
 10. Edge Detail: Tongue and groove.
 11. Surface Finish: Fully sanded face.

C. Subflooring: APA-rated sheathing.

1. Exposure Durability Classification: Exterior.
2. Exposure Durability Classification: Exposure 1.
3. Span Rating: As required to suit joist spacing indicated.
4. Span Rating: 24/16, 32/16, or Subfloor - 16.
5. Span Rating: 40/20 or Subfloor - 20.
6. Span Rating: 48/24 or Subfloor - 24.

D. Wall Sheathing: APA-rated sheathing.

E. Wall Sheathing: APA-rated Structural I sheathing.

1. Exposure Durability Classification: Exterior.
2. Exposure Durability Classification: Exposure 1.
3. Span Rating: As required to suit stud spacing indicated.
4. Span Rating: 12/0, 16/0, 20/0, or Wall - 16 for stud spacing of 16 inches (406 mm) or less.
5. Span Rating: 24/0, 24/16, 32/16, or Wall - 24 for stud spacing of 24 inches (610 mm) or less.

F. Roof Sheathing: APA-rated sheathing.

G. Roof Sheathing: APA-rated Structural I sheathing.

1. Exposure Durability Classification: Exterior.
2. Exposure Durability Classification: Exposure 1.
3. Span Rating: As required to suit rafter spacing indicated.
4. Span Rating: 12/0.
5. Span Rating: 16/0 or Roof - 16.
6. Span Rating: 20/0 or Roof - 20.
7. Span Rating: 24/0 or Roof - 24.
8. Span Rating: 24/16.
9. Span Rating: 32/16 or Roof - 32.
10. Span Rating: 40/20 or Roof - 40.
11. Span Rating: 48/24 or Roof - 48.

2.14 PARTICLEBOARD

- A. General: Comply with and factory mark each panel according to ANSI A208.1. Provide thickness indicated.
- B. Particleboard Underlayment: Grade PBU.
- C. Particleboard Subflooring: Grade M-3-Exterior Glue.
- D. Particleboard Wall Sheathing: Grade M-1-Exterior Glue.

2.15 FIBROUS-FELTED BOARD

- A. Hardboard Underlayment: ANSI/AHA A135.4, Class 4 (Service), Surface S1S; with back side sanded to produce boards with uniform thickness of 0.215 or 0.200 inch (5.5 or 5 mm), as standard with manufacturer, plus or minus 0.005 inch (0.13 mm).
- B. Fiberboard Sheathing: ANSI/AHA A194.1, Type IV cellulosic fiberboard sheathing with square edges, class, and thickness indicated below:
 - 1. Class 1 (regular density), size as follows:
 - a. Size: 1/2 inch (13 mm) thick.
 - b. Size: 25/32 inch (20 mm) thick.
 - 2. Class 2 (intermediate density), 1/2 inch (13 mm) thick.

2.19 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.20 METAL FRAMING ANCHORS

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:
 - 1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
 - 2. Allowable Design Loads: Provide products with allowable design loads, 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.
- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.
- C. Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges at least 85 percent of joist depth.

1. Thickness: 0.052 inch (1.3 mm).
 2. Thickness: 0.064 inch (1.6 mm).
- D. 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. Strap Width: 2 inches (50 mm).
 3. Thickness: 0.052 inch (1.3 mm).
 4. Thickness: 0.064 inch (1.6 mm).
- 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 0.064 inch (1.6 mm) thick, standoff and adjustment plates 0.108 inch (2.8 mm) thick.

2.21 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.
- C. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbonate (IPBC) as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
 2. Published requirements of metal framing anchor manufacturer.
 3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."
 4. "Table 23-I-Q--Nailing Schedule" of the Uniform Building Code.

- 5. "Table 2305.2--Fastening Schedule" of the BOCA National Building Code.
- 6. "Table 1705.1--Fastening Schedule," of the Standard Building Code.

- F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.
- H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
 - 1. Firestop furred spaces of walls at each floor level and at ceiling with wood blocking or noncombustible materials, accurately fitted to close furred spaces.
- B. Furring to Receive Plywood Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring at 24 inches (610 mm) o.c., horizontally and vertically. Select furring with no knots capable of producing bent-over nails and damage to paneling.
- C. Furring to Receive Plywood Paneling: Install 19-by-63-mm actual-size furring at 600 mm o.c., horizontally and vertically. Select furring with no knots capable of producing bent-over nails and damage to paneling.
- D. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring at 16 inches (406 mm) o.c., vertically.
- E. Furring to Receive Gypsum Board: Install 19-by-38-mm actual-size furring at 400 mm o.c., vertically.
- F. Furring to Receive Plaster Lath: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring at 16 inches (406 mm) o.c., vertically.
- G. Furring to Receive Plaster Lath: Install 19-by-38-mm actual-size furring at 400 mm o.c., vertically.

3.4 WOOD FRAMING, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Install framing members of size and at spacing indicated.
- D. Do not splice structural members between supports.
- E. Firestop concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where firestopping is not inherent in framing system used, provide closely fitted wood blocks of 2-inch nominal- (38-mm actual-) thickness lumber of same width as framing members.

3.5 WALL AND PARTITION FRAMING

- A. General: Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction, unless otherwise indicated.
 - 1. For exterior walls, provide 2-by-6-inch nominal- (38-by-140-mm actual-) size wood studs spaced 24 inches (610 mm) o.c., except where otherwise indicated or required.
 - 2. For exterior walls, provide 2-by-4-inch nominal- (38-by-89-mm actual-) size wood studs spaced 16 inches (406 mm) o.c., except where otherwise indicated or required.
 - 3. For exterior walls, provide 38-by-140-mm actual-size wood studs spaced 600 mm o.c., except where otherwise indicated or required.
 - 4. For exterior walls, provide 38-by-89-mm actual-size wood studs spaced 400 mm o.c., except where otherwise indicated or required.
 - 5. For interior partitions and walls, provide 2-by-4-inch nominal- (38-by-89-mm actual-) size wood studs spaced 16 inches (406 mm) o.c., except where otherwise indicated or required.
 - 6. For interior partitions and walls, provide 38-by-89-mm actual-size wood studs spaced 400 mm o.c., except where otherwise indicated or required.
- B. Construct corners and intersections with 3 or more studs. Provide miscellaneous blocking and framing as shown and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide continuous horizontal blocking at midheight of single-story partitions over 96 inches (2438 mm) high and multistory partitions, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.
 - 1. For non-load-bearing partitions, provide double-jamb studs with headers not less than 4-inch nominal (89-mm actual) depth for openings 36 inches (900 mm) and less in width, and not less than 6-inch nominal (140-mm actual) depth for wider openings.
 - 2. For load-bearing walls, provide double-jamb studs for openings 72 inches (1800 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth shown or, if not shown, as recommended by AFPA's "Manual for Wood Frame Construction."

- D. Provide bracing in exterior walls, at both walls of each external corner, full-story height, unless otherwise indicated. Provide one of the following:
- E. Provide bracing in walls, at locations indicated, full-story height, unless otherwise indicated. Provide one of the following:
 - 1. Diagonal bracing at 45-degree angle using let-in 1-by-4-inch nominal- (19-by-89-mm actual-) size boards.
 - 2. Diagonal bracing at 45-degree angle using metal bracing.
 - 3. Plywood panels, not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.
 - 4. Performance-rated structural-use panels, not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.
 - 5. Particleboard sheathing panels, not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.
 - 6. In lieu of bracing at corners or at locations indicated, continuous gypsum sheathing may be provided in panels not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.
 - 7. In lieu of bracing at corners or at locations indicated, continuous fiberboard sheathing, intermediate type, may be provided in panels not less than 48 by 96 inches (1219 by 2438 mm) applied vertically.

3.9 STAIR FRAMING

- A. Provide stair framing members of size, space, and configuration indicated or, if not otherwise indicated, to comply with the following requirements:
 - 1. Stringer Size: 2-by-12-inch nominal- (38-by-286-mm actual-) size minimum.
 - 2. Notching: Notch stringers to receive treads, risers, and supports; leave at least 3-1/2 inches (89 mm) of effective depth.
 - 3. Stringer Spacing: At least 3 stringers for each 36-inch (914-mm) clear width of stair.
- B. Provide stair framing that does not exceed the following variations between treads and risers within each flight:
 - 1. Adjacent Treads and Risers: 3/16 inch (4.7 mm).
 - 2. Between Largest and Smallest Treads and Risers: 3/8 inch (9.5 mm).

3.10 INSTALLATION OF STRUCTURAL-USE PANELS

- A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
 - 1. Comply with "Code Plus" provisions of above-referenced guide.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Combination Subflooring-Underlayment: Glue and nail to framing throughout.
 - 2. Combination Subflooring-Underlayment: Nail to framing.
 - a. Space panels 1/8 inch (3 mm) at edges and ends.

3. Subflooring: Glue and nail to framing throughout.
4. Subflooring: Nail to framing.
5. Subflooring: Nail or staple to framing.
 - a. Space panels 1/8 inch (3 mm) at edges and ends.
6. Sheathing: Nail to framing.
7. Sheathing: Nail or staple to framing.
 - a. Space panels 1/8 inch (3 mm) at edges and ends.
8. Underlayment: Nail to subflooring.
9. Underlayment: Nail or staple to subflooring.
 - a. Space panels 1/32 inch (0.8 mm) at edges and ends.
 - b. Fill and sand edge joints of underlayment receiving resilient flooring just before installing flooring.
10. Plywood Backing Panels: Nail or screw to supports.

3.11 AIR-INFILTRATION BARRIER

A. Cover sheathing with air-infiltration barrier as follows:

1. Apply asphalt-saturated organic felt horizontally with 2-inch (50-mm) overlap and 6 inch (150 mm) end lap; fasten to sheathing with galvanized staples or roofing nails.
2. Apply air retarder to comply with manufacturer's written instructions.
3. Apply air-infiltration barrier to cover upstanding flashing with 4-inch (100-mm) overlap.

END OF SECTION 06100