SECTION 061000 - ROUGH CARPENTRY

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Framing with dimension lumber.

Retain first subparagraph below for timber incidental to conventional framing. For extensive timber framing, use Section 061300 "Heavy Timber Construction."

Framing with timber.

Framing with engineered wood products.

Shear wall panels.

Rooftop equipment bases and support curbs.

Wood blocking[**, cants,**] and nailers.

Wood furring[**and grounds**].

Wood sleepers.

Delete first subparagraph below if specified as finish carpentry.

Utility shelving.

Plywood backing panels.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 061063 "Exterior Rough Carpentry."

Section 061300 "Heavy Timber Construction."

Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

Section 061753 "Shop-Fabricated Wood Trusses" for wood trusses made from dimension lumber.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
				2. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
				3. Exposed Framing: Framing not concealed by other construction.
				4. OSB: Oriented strand board.
				5. Timber: Lumber of 5 inches nominal size or greater in least dimension.
			1. SUBMITTALS
				1. General: Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.

For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

* + - * 1. Sustainable Design Submittals:

Retain "Fastener Patterns" Paragraph below for exposed framing if fastener locations are critical to appearance and fastener patterns are not indicated on Drawings.

* + - * 1. Fastener Patterns: Full-size templates for fasteners in exposed framing.

Retain "Material Certificates" Paragraph below if applicable; delete if species and grade are indicated for each use.

* + - * 1. 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 ALSC Board of Review.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

* + - * 1. Evaluation Reports: For the following, from ICC-ES:

Wood-preservative-treated wood.

Fire-retardant-treated wood.

Engineered wood products.

Shear panels.

Power-driven fasteners.

Post-installed anchors.

Metal framing anchors.

* + - 1. QUALITY ASSURANCE
				1. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
				2. Mill and Producers Mark: Each piece of lumber and plywood shall be gradestamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.

Pressure Preservative Treated Material: Accredited agency quality mark on each piece of wood indicating treatment.

Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications

* + - 1. WOOD PRODUCTS, GENERAL
				1. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.

Retain only first option in first subparagraph below if authorities having jurisdiction require grade stamps on all materials.

For exposed lumber indicated to receive a stained or natural finish, [**mark grade stamp on end or back of each piece**] [**or**] [**omit grade stamp and provide certificates of grade compliance issued by grading agency**].

Revise subparagraph below if rough lumber is acceptable for all work.

Dress lumber, S4S, unless otherwise indicated.

Retain one of five options in "Maximum Moisture Content of Lumber" Paragraph below, or delete paragraph if green lumber is acceptable in all thicknesses. Verify availability of lumber with 15 percent maximum moisture content before retaining. Lumber more than 2 inches nominal in thickness is often shipped green. See the Evaluations.

* + - * 1. Maximum Moisture Content of Lumber: [**15 percent**] [**19 percent**] [**15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness**] [**15 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness**] [**19 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness**] unless otherwise indicated.
				2. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

Allowable design stresses, as published by manufacturer, shall 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.

* + - 1. WOOD-PRESERVATIVE-TREATED LUMBER
				1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2[**for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground**].

See the Evaluations for information about treatment chemicals.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.[**Do not use inorganic boron (SBX) for sill plates.**]

Retain subparagraph below for exposed framing if considered necessary.

For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

* + - * 1. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
				2. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

Retain only first option in subparagraph below if authorities having jurisdiction require quality mark on all materials.

For exposed lumber indicated to receive a stained or natural finish, [**mark end or back of each piece**] [**or**] [**omit marking and provide certificates of treatment compliance issued by inspection agency**].

Retain first option in "Application" Paragraph below and delete list that follows if all rough carpentry must be treated with wood preservative. Coordinate paragraph and list with requirements for fire-retardant-treated materials; wood cannot be both preservative treated and fire-retardant treated.

* + - * 1. Application: Treat [**all rough carpentry unless otherwise indicated.**] [**items indicated on Drawings, and the following:**]

Retain first subparagraph below if Project includes wood adjacent to roofing or waterproofing.

Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

Wood sills, sleepers, blocking, [**furring,**] [**stripping,**] and similar concealed members in contact with masonry or concrete.

Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.

Wood floor plates that are installed over concrete slabs-on-grade.

Insert other items that require treatment but are not likely to be indicated on Drawings.

* + - 1. FIRE-RETARDANT-TREATED MATERIALS
				1. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
				2. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

Treatment shall not promote corrosion of metal fasteners.

Exterior type is suitable for both exterior and interior applications. Interior type is only for interior applications.

Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.

Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.

Retain option in "Design Value Adjustment Factors" Subparagraph below if applicable. Revise description of locations to suit Project. Verify adjustment factors with Project's structural engineer.

Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841.[**For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.**]

Retain option in first paragraph below if required for plywood backing panels.

* + - * 1. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.[**Kiln-dry plywood after treatment to maximum moisture content of 15 percent.**]
				2. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

Retain only first option in subparagraph below if authorities having jurisdiction require classification marking on all materials.

For exposed lumber indicated to receive a stained or natural finish, [**mark end or back of each piece**] [**or**] [**omit marking and provide certificates of treatment compliance issued by testing agency**].

Delete or revise first paragraph below if no exposed framing or if staining will hide colorants.

* + - * 1. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.

Retain first option in "Application" Paragraph below and delete list that follows if all rough carpentry must be treated with fire retardant. Coordinate paragraph and list with requirements for wood-preservative-treated materials; wood cannot be both preservative treated and fire-retardant treated.

* + - * 1. Application: Treat [**all rough carpentry unless otherwise indicated.**] [**items indicated on Drawings, and the following:**]

Framing for raised platforms.

Framing for stages.

Concealed blocking.

Framing for non-load-bearing partitions.

Framing for non-load-bearing exterior walls.

Roof construction.

Plywood backing panels.

Insert other items that require treatment but are not likely to be indicated on Drawings.

* + - 1. DIMENSION LUMBER FRAMING

"Non-Load-Bearing Interior Partitions," "Load-Bearing Partitions," "Ceiling Joists," and "Joists, Rafters, and Other Framing Not Listed Above" paragraphs in this article provide choices for specifying different categories of framing. Retain one paragraph for each category of framing required. In each paragraph where grade designations are used, grades are listed in order of decreasing quality (and cost).

* + - * 1. Non-Load-Bearing Interior Partitions: [**Construction or No. 2**] [**Construction, Stud, or No. 3**] [**Standard, Stud, or No. 3**] grade.

Application: [**All interior partitions**] [**Interior partitions not indicated as load bearing**].

Species:

Usually retain all species below that meet requirements except those unavailable in Project's location. Species groups are listed in order of decreasing modulus of elasticity. Some species groups below overlap others; delete subparagraphs as necessary to eliminate duplication.

Hem-fir (north); NLGA.

Southern pine or mixed southern pine; SPIB.

Spruce-pine-fir; NLGA.

Hem-fir; WCLIB, or WWPA.

Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

Northern species includes hem-fir (north) and spruce-pine-fir.

Northern species; NLGA.

Eastern softwoods includes spruce-pine-fir (south).

Eastern softwoods; NeLMA.

Western woods includes hem-fir and spruce-pine-fir (south).

Western woods; WCLIB or WWPA.

* + - * 1. Load-Bearing Partitions: [**No. 2**] [**Construction or No. 2**] [**Construction, Stud, or No. 3**] grade.

Application: [**Exterior walls**] [**and**] [**interior load-bearing partitions**].

Species:

Usually retain all species below that meet requirements except those unavailable in Project's location. Species groups are listed in order of decreasing strength (extreme fiber in bending).

Hem-fir (north); NLGA.

Southern pine; SPIB.

Douglas fir-larch; WCLIB or WWPA.

Delete "Southern pine; SPIB" Subparagraph above if retaining first subparagraph below.

Southern pine or mixed southern pine; SPIB.

Spruce-pine-fir; NLGA.

Douglas fir-south; WWPA.

Hem-fir; WCLIB or WWPA.

Douglas fir-larch (north); NLGA.

Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

First "Load-Bearing Partitions" Paragraph below is an example for machine stress-rated lumber that can be used instead of "Load-Bearing Partitions" Paragraph above. Three grades listed below are most commonly available.

* + - * 1. Load-Bearing Partitions: Any species of machine stress-rated dimension lumber with a grade of not less than [**2400f-2.0E**] [**2100f-1.8E**] [**1650f-1.5E**].

Application: [**Exterior walls**] [**and**] [**interior load-bearing partitions**].

"Load-Bearing Partitions" Paragraph below is an example of a performance requirement that can be used instead of two "Load-Bearing Partitions" paragraphs above.

* + - * 1. Load-Bearing Partitions: Any species and grade with a modulus of elasticity of at least [**1,500,000 psi**] [**1,300,000 psi**] [**1,100,000 psi**] [**1,000,000 psi**] [**900,000 psi**] and an extreme fiber stress in bending of at least [**1000 psi**] [**850 psi**] [**700 psi**] [**600 psi**] [**500 psi**] for 2-inch nominal thickness and 12-inch nominal width for single-member use.

Application: [**Exterior walls**] [**and**] [**interior load-bearing partitions**].

* + - * 1. Ceiling Joists: [**Construction or No. 2**] [**Construction, Stud, or No. 3**] [**Standard, Stud, or No. 3**] grade.

Species:

Usually retain all species below that meet requirements except those unavailable in Project's location. Species groups are listed in order of decreasing modulus of elasticity. Some species groups below overlap others; delete subparagraphs as necessary to eliminate duplication.

Hem-fir (north); NLGA.

Southern pine; SPIB.

Douglas fir-larch; WCLIB or WWPA.

Douglas fir-larch (north); NLGA.

Delete "Southern pine; SPIB" Subparagraph above if retaining first subparagraph below.

Southern pine or mixed southern pine; SPIB.

Spruce-pine-fir; NLGA.

Hem-fir; WCLIB or WWPA.

Douglas fir-south; WWPA.

Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

Northern species includes hem-fir (north), spruce-pine-fir, and Douglas fir-larch (north).

Northern species; NLGA.

Eastern softwoods includes spruce-pine-fir (south).

Eastern softwoods; NeLMA.

Western woods includes hem-fir, Douglas fir-larch, spruce-pine-fir (south), and Douglas fir-south.

Western woods; WCLIB or WWPA.

If retaining first "Joists, Rafters, and Other Framing Not Listed Above" Paragraph below, retain one of five options for grade; verify with structural requirements. Generally, retain "No. 2" or "Construction or No. 2" option for best economy if grades suit structural requirements.

* + - * 1. Joists, Rafters, and Other Framing Not Listed Above: [**Select Structural**] [**No. 1**] [**No. 2**] [**Construction or No. 2**] [**Construction, Stud, or No. 3**] grade.

Species:

Revise list below; usually retain all species that meet requirements except those unavailable in Project's location. Species groups are listed in order of decreasing strength (extreme fiber in bending).

Hem-fir (north); NLGA.

Southern pine; SPIB.

Douglas fir-larch; WCLIB or WWPA.

Delete "Southern pine; SPIB" Subparagraph above if retaining first subparagraph below.

Southern pine or mixed southern pine; SPIB.

Spruce-pine-fir; NLGA.

Douglas fir-south; WWPA.

Hem-fir; WCLIB or WWPA.

Douglas fir-larch (north); NLGA.

Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

First "Joists, Rafters, and Other Framing Not Listed Above" Paragraph below is an example for machine stress-rated lumber that can be used instead of last paragraph above or performance requirement in second paragraph below. Three grades listed are most commonly available.

* + - * 1. Joists, Rafters, and Other Framing Not Listed Above: Any species of machine stress-rated dimension lumber with a grade of not less than [**2400f-2.0E**] [**2100f-1.8E**] [**1650f-1.5E**].

"Joists, Rafters, and Other Framing Not Listed Above" Paragraph below is an example of a performance requirement that can be used instead of two "Joists, Rafters, and Other Framing Not Listed Above" paragraphs above.

* + - * 1. Joists, Rafters, and Other Framing Not Listed Above: Any species and grade with a modulus of elasticity of at least [**1,500,000 psi**] [**1,300,000 psi**] [**1,100,000 psi**] [**1,000,000 psi**] [**900,000 psi**] and an extreme fiber stress in bending of at least [**1000 psi**] [**850 psi**] [**700 psi**] [**600 psi**] [**500 psi**] for 2-inch nominal thickness and 12-inch nominal width for single-member use.

Retain "Exposed Framing( Indicated to Receive a Stained or Natural Finish)" Paragraph below for high-quality appearance. Delete if not applicable or if grade and species retained above are suitable. See the Evaluations.

* + - * 1. Exposed Framing[**Indicated to Receive a Stained or Natural Finish**]: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

Retain first "Species and Grade" Subparagraph below or retain (or insert) one or more "Species and Grade" subparagraphs below.

Species and Grade: As indicated above for load-bearing construction of same type.

First 10 "Species and Grade" subparagraphs below are listed in order of decreasing strength (extreme fiber stress in bending).

Species and Grade: Hem-fir (north); [**Select Structural**] [**No. 1**] grade; NLGA.

Species and Grade: Southern pine; [**Select Structural**] [**No. 1**] [**No. 2**] grade; SPIB.

Species and Grade: Douglas fir-larch; [**Select Structural**] [**No. 1**] grade; WCLIB or WWPA.

Species and Grade: Mixed southern pine; [**Select Structural**] [**No. 1**] [**No. 2**] grade; SPIB.

Species and Grade: Spruce-pine-fir; [**Select Structural**] [**No. 1**] grade; NLGA.

Species and Grade: Douglas fir-south; [**Select Structural**] [**No. 1**] grade; WWPA.

Species and Grade: Hem-fir; [**Select Structural**] [**No. 1**] grade; WCLIB or WWPA.

Species and Grade: Douglas fir-larch (north); [**Select Structural**] [**No. 1**] grade; NLGA.

Species and Grade: Spruce-pine-fir (south); [**Select Structural**] [**No. 1**] grade; NeLMA, WCLIB, or WWPA.

Species and Grade: Eastern hemlock-balsam fir or eastern hemlock-tamarack; [**Select Structural**] [**No. 1**] grade; NeLMA.

Retain one or more "Species and Grade" subparagraphs below, if needed for their appearance, only after verifying availability. Six species groups below are listed in order of decreasing strength (extreme fiber stress in bending).

Species and Grade: Beech-birch-hickory; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Northern red oak; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Redwood; [**Clear Heart Structural**] [**Clear Structural**] [**Select Structural**] [**No. 1**] grade; RIS.

Species and Grade: Mixed oak; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Mixed maple; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Western cedars; [**Select Structural**] [**No. 1**] grade; WCLIB or WWPA.

* + - 1. TIMBER FRAMING

Delete this article if not applicable. Use Section 061300 "Heavy Timber Construction" if timber framing is extensive.

* + - * 1. Comply with the following requirements, according to grading rules of grading agency indicated:

"Species and Grade" subparagraphs below are examples only. Revise or insert other requirements to suit Project. As an alternative, delete species and grade and specify stress values. See examples in "Dimension Lumber Framing" Article. Douglas fir-larch (north) and Douglas fir-south are not as strong as Douglas fir-larch; Eastern hemlock and eastern hemlock-tamarack are not as strong as eastern hemlock-tamarack (north); hem-fir (north) is not as strong as hem-fir.

Species and Grade: Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; [**Select Structural**] [**No. 1**] grade; NLGA, WCLIB, or WWPA.

Species and Grade: Eastern hemlock, eastern hemlock-tamarack, or eastern hemlock-tamarack (north); [**Select Structural**] [**No. 1**] grade; NeLMA or NLGA.

Species and Grade: Hem-fir or hem-fir (north); [**Select Structural**] [**No. 1**] grade; NLGA, WCLIB, or WWPA.

Species and Grade: Mixed maple; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Mixed oak; [**Select Structural**] [**No. 1**] grade; NeLMA.

Species and Grade: Southern pine; [**Select Structural**] [**No. 1**] grade; SPIB.

Options in "Maximum Moisture Content" Subparagraph below are values in SPIB rules for kiln-dried and air-dried timber, respectively.

Maximum Moisture Content: [**20**] [**23**] <**Insert number**> percent.

Retain "Additional Restriction" Subparagraph below if minimum twist and seasoning check are required, which increases cost; availability is limited.

Additional Restriction: Free of heart centers.

* + - 1. ENGINEERED WOOD PRODUCTS
				1. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

Remaining paragraphs below are examples of descriptive and property requirements based on Product Data of various manufacturers. Verify that current products comply or revise to suit Project. See the Evaluations.

* + - * 1. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12009) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Boise Cascade Company](http://www.specagent.com/Lookup?uid=123457137309).

[Louisiana-Pacific Corporation](http://www.specagent.com/Lookup?uid=123457137313).

[Weyerhaeuser Company](http://www.specagent.com/Lookup?uid=123457137319).

Approved equivalent.

Extreme Fiber Stress in Bending, Edgewise: [**3100 psi**] [**2900 psi**] [**2600 psi**] [**2250 psi**] for 12-inch nominal- depth members.

Modulus of Elasticity, Edgewise: [**2,000,000 psi**] [**1,800,000 psi**] [**1,500,000 psi**].

Insert other properties of laminated-veneer lumber here if critical.

* + - * 1. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12010) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Weyerhaeuser Company](http://www.specagent.com/Lookup?uid=123457137325).

Approved equivalent.

Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal- depth members.

Modulus of Elasticity, Edgewise: 2,200,000 psi.

Insert other properties of parallel-strand lumber here if critical.

* + - * 1. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=12011) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Boise Cascade Company](http://www.specagent.com/Lookup?uid=123457137327).

[Louisiana-Pacific Corporation](http://www.specagent.com/Lookup?uid=123457137333).

[Stark Truss Company, Inc](http://www.specagent.com/Lookup?uid=123457137338).

[Weyerhaeuser Company](http://www.specagent.com/Lookup?uid=123457137340).

Approved equivalent.

Retain one option in "Web Material" Subparagraph below. Flange material is determined by performance rating. See the Evaluations in Section 061600 "Sheathing" for information about durability classifications of plywood and OSB.

Web Material: [**Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1**] [**Plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1**] [**Plywood, complying with DOC PS 1, Exterior grade**].

Structural Properties: Depths and design values not less than those indicated.

APA-EWS ratings referenced in subparagraph below are easy to designate structural properties required, but retaining below may reduce competition by eliminating manufacturers that do not participate in APA-EWS program. See the Evaluations.

Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.

Retain "Rim Boards" Paragraph if required for use with wood I-joists. I-joist blocking can also be used, but rim board is stronger and requires less labor.

* + - * 1. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.

Manufacturer: Provide products by same manufacturer as I-joists.

Usually retain all options in "Material" Subparagraph below.

Material: [**All-veneer product**] [**glued-laminated wood**] [**or**] [**product made from any combination solid lumber, wood strands, and veneers**].

Thickness: [**1 inch**] [**1-1/8 inches**] [**1-1/4 inches**].

Referencing APA-EWS standard may reduce competition by eliminating manufacturers that do not participate in APA-EWS program. See the Evaluations.

Comply with APA PRR-401, [**rim board**] [**rim board plus**] grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

* + - * 1. Insulated Rim Boards: Insulated product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.

Manufacturer: Provide products by same manufacturer as I-joists.

Usually retain all options in "Rim Board Material" Subparagraph below.

Rim Board Material: [**All-veneer product**] [**glued-laminated wood**] [**or**] [**product made from any combination solid lumber, wood strands, and veneers**].

Rim Board Thickness: [**1 inch**] [**1-1/8 inches**] [**1-1/4 inches**].

Insulation: 1-1/2-inch- thick polyisocyanurate foam complying with ASTM C1289.

Inside Facing: 7/16-inch- thick OSB.

Referencing APA-EWS standard may reduce competition by eliminating manufacturers that do not participate in APA-EWS program. See the Evaluations.

Comply with APA PRR-401, [**rim board**] [**rim board plus**] grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

* + - 1. SHEAR WALL PANELS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=12012) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[MarinoWARE](http://www.specagent.com/Lookup?uid=123457196813).

[Shear Transfer Systems](http://www.specagent.com/Lookup?uid=123457137320).

[Simpson Strong-Tie Co., Inc](http://www.specagent.com/Lookup?uid=123457137321).

Approved equivalent.

* + - * 1. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood or OSB sheathing.
				2. Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized-steel panel, steel top and bottom plates, and wood studs.
				3. Allowable design loads, as published by manufacturer, shall meet or exceed those [**indicated**] [**of basis-of-design products**] [**of products of manufacturers listed**]. 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.
			1. MISCELLANEOUS LUMBER
				1. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

Blocking.

Nailers.

Rooftop equipment bases and support curbs.

Cants.

Furring.

Grounds.

Utility shelving.

* + - * 1. Dimension Lumber Items: [**Construction or No. 2**] [**Standard, Stud, or No. 3**] grade lumber of [**any species.**] [**any of the following species:**] [**the following species:**]

Usually retain all species below that meet requirements except those unavailable in Project's location. Species groups are listed in order of decreasing strength (extreme fiber stress in bending). Some species groups below overlap others; delete subparagraphs as necessary to eliminate duplication.

Hem-fir (north); NLGA.

Mixed southern pine or southern pine; SPIB.

Spruce-pine-fir; NLGA.

Hem-fir; WCLIB or WWPA.

Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

Western woods includes hem-fir and spruce-pine-fir (south).

Western woods; WCLIB or WWPA.

Northern species includes hem-fir (north) and spruce-pine-fir.

Northern species; NLGA.

Eastern softwoods includes spruce-pine-fir (south).

Eastern softwoods; NeLMA.

* + - * 1. Utility Shelving: Lumber with [**15**] [**19**] percent maximum moisture content of [**any of the following**] [**the following**] species and grades:

Revise list below; usually retain all species that meet requirements except those unavailable in Project's location. Species groups below are not necessarily of equal quality even when of same grade.

Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; [**Premium or No. 2 Common (Sterling)**] [**Standard or No. 3 Common**] grade; NeLMA, NLGA, WCLIB, or WWPA.

Mixed southern pine or southern pine; No. [**1**] [**2**] grade; SPIB.

Hem-fir or hem-fir (north); [**Select Merchantable or No. 1 Common**] [**Construction or No. 2 Common**] grade; NLGA, WCLIB, or WWPA.

Spruce-pine-fir (south) or spruce-pine-fir; [**Select Merchantable or No. 1 Common**] [**Construction or No. 2 Common**] grade; NeLMA, NLGA, WCLIB, or WWPA.

Retain "Concealed Boards" Paragraph below for furring, grounds, and nailing strips if required, and for truss bracing specified by referencing this Section.

* + - * 1. Concealed Boards: [**15**] [**19**] percent maximum moisture content and [**any of**]the following species and grades:

Revise list below; usually retain all species that meet requirements except those unavailable in Project's location. Species groups below are not necessarily of equal quality even when of same grade.

Mixed southern pine or southern pine; No. [**2**] [**3**] grade; SPIB.

Hem-fir or hem-fir (north); [**Construction or No. 2 Common**] [**Standard or No. 3 Common**] grade; NLGA, WCLIB, or WWPA.

Spruce-pine-fir (south) or spruce-pine-fir; [**Construction or No. 2 Common**] [**Standard or No. 3 Common**] grade; NeLMA, NLGA, WCLIB, or WWPA.

Three species groups below include last two above; if retaining any of three below, delete one of, or both, above to eliminate duplication.

Eastern softwoods; No. [**2**] [**3**] Common grade; NeLMA.

Northern species; No. [**2**] [**3**] Common grade; NLGA.

Western woods; [**Construction or No. 2 Common**] [**Standard or No. 3 Common**] grade; WCLIB or WWPA.

* + - * 1. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
				2. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
				3. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
			1. PLYWOOD BACKING PANELS

See the Evaluations in Section 061600 "Sheathing" for information on plywood grades.

* + - * 1. Equipment Backing Panels: Plywood, DOC PS 1, [**Exterior, A-C**] [**Exterior, C-C Plugged**] [**Exposure 1, C-D Plugged**], [**fire-retardant treated,**] in thickness indicated or, if not indicated, not less than [**1/2-inch**] [**3/4-inch**] nominal thickness.
			1. FASTENERS
				1. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners[**with hot-dip zinc coating complying with ASTM A153**] [**of Type 304 stainless steel**].

* + - * 1. Nails, Brads, and Staples: ASTM F1667.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

* + - * 1. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

ICC-ES AC01 and ICC-ES AC193 are for mechanical anchors in masonry and concrete respectively, ICC-ES AC58 and ICC-ES AC308 are for adhesive anchors in masonry and concrete.

* + - * 1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on [**ICC-ES AC01**] [**ICC-ES AC58**] [**ICC-ES AC193**] [**or**] [**ICC-ES AC308**] as appropriate for the substrate.

Two "Material" subparagraphs below are examples only. First subparagraph protects against corrosion in an indoor atmosphere; revise to suit other service conditions after verifying availability of thicker coatings.

Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

* + - 1. METAL FRAMING ANCHORS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=12013) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Cleveland Steel Specialty Co](http://www.specagent.com/Lookup?uid=123457137341).

[Phoenix Metal Products, Inc](http://www.specagent.com/Lookup?uid=123457137343).

[Simpson Strong-Tie Co., Inc](http://www.specagent.com/Lookup?uid=123457137344).

Approved equivalent.

* + - * 1. Allowable design loads, as published by manufacturer, shall meet or exceed those [**indicated**] [**of basis-of-design products**] [**of products of manufacturers listed**]. 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. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

Galvanized steel is typical for most manufacturers and is suitable for most applications.

* + - * 1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G60 coating designation.

Use for interior locations unless otherwise indicated.

* + - * 1. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653; 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 coating designation; and not less than 0.036 inch thick.

Use for wood-preservative-treated lumber and where indicated.

Type 304 is usually standard for stainless steel; Type 316 gives better corrosion resistance for exposed applications in coastal environments.

* + - * 1. Stainless Steel Sheet: ASTM A240 or ASTM A666, [**Type 304**] [**Type 316**].

Use for exterior locations and where indicated.

First 11 paragraphs below are examples only. Revise to suit Project or delete all if "Basis-of-Design Product" Paragraph is used and below are not needed to provide salient characteristics for products.

* + - * 1. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.

Thickness: [**0.050 inch**] [**0.062 inch**].

* + - * 1. I-Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges full depth of joist. Nailing flanges provide lateral support at joist top chord.

Thickness: [**0.050 inch**] [**0.062 inch**].

* + - * 1. 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.

Strap Width: [**1-1/2 inches**] [**2 inches**].

Thickness: [**0.050 inch**] [**0.062 inch**].

* + - * 1. Bridging: Rigid, V-section, nailless type, 0.050 inch thick, length to suit joist size and spacing.
				2. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch- minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.
				3. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

Width: [**3/4 inch**] [**1-1/4 inches**].

Thickness: [**0.050 inch**] [**0.062 inch**].

Length: [**16 inches**] [**24 inches**] [**As indicated**].

* + - * 1. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick.[**Tie fastens to side of rafter or truss, face of top plates, and side of stud below.**]
				2. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.
				3. Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches wide by 0.050 inch thick by 36 inches long.
				4. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.

Bolt Diameter: [**5/8 inch**] [**3/4 inch**].

Width: [**2-1/2 inches**] [**3-3/16 inches**].

Body Thickness: [**0.108 inch**] [**0.138 inch**].

Base Reinforcement Thickness: [**0.108 inch**] [**0.239 inch**].

* + - * 1. Wall Bracing: T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches wide by 9/16 inch deep by 0.034 inch thick with hemmed edges.
				2. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch thick with hemmed edges.
			1. MISCELLANEOUS MATERIALS

Retain one of two "Sill-Sealer Gaskets" paragraphs below if required. First paragraph is suitable for dry masonry. Second paragraph is more suitable for applications close to the ground or likely to remain damp.

* + - * 1. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
				2. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

Retain "Flexible Flashing" Paragraph below if required as a separator between preservative-treated wood and metal decking.

* + - * 1. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, [**butyl rubber**] [**or**] [**rubberized-asphalt**] compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
				2. Adhesives for Gluing [**Furring**] [**and**] [**Sleepers**] to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

Treatment in "Water-Repellent Preservative" Paragraph below is for exposed ends of posts and beams, not for treating cuts in preservative-treated lumber.

* + - * 1. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.
1. EXECUTION
	* + 1. INSTALLATION, GENERAL
				1. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
				2. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
				3. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate [**furring,**]nailers, blocking, [**grounds,**]and similar supports to comply with requirements for attaching other construction.
				4. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.[**Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.**]
				5. Install shear wall panels to comply with manufacturer's written instructions.
				6. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
				7. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
				8. Do not splice structural members between supports unless otherwise indicated.
				9. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

* + - * 1. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.

Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.

Usually indicate and describe fire blocking for cornices and trim on Drawings.

Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

* + - * 1. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
				2. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Use inorganic boron for items that are continuously protected from liquid water.

Use copper naphthenate for items not continuously protected from liquid water.

* + - * 1. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
				2. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

Retain one of first two subparagraphs below, as required to comply with requirements of Project and local codes.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

Table 2304.9.1, "Fastening Schedule," in the Uniform Code

Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the Uniform Code's International Residential Code for One- and Two-Family Dwellings.

ICC-ES evaluation report for fastener.

Revise first paragraph below to include other kinds of nails if required.

* + - * 1. Use steel common nails unless otherwise indicated. 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. Drive nails snug but do not countersink nail heads unless otherwise indicated.

Delete paragraph below if no exposed framing.

* + - * 1. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

Retain first option in first subparagraph below if Contractor is required to submit fastener patterns for approval; retain second option if fastener patterns are indicated on Drawings. Fastener patterns help ensure a good appearance.

Comply with [**approved**] [**indicated**] fastener patterns where applicable.[**Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.**]

Retain one of two subparagraphs below. Retain second if finishing nails do not comply with structural requirements or if appearance of common nails is needed.

Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

Indicate locations of other fasteners, such as wood screws, bolts, and lag screws, on Drawings.

* + - 1. INSTALLATION OF WOOD BLOCKING AND NAILERS
				1. Install where indicated and where required for[**screeding or**] attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
				2. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

Retain paragraph below for conventional, not veneer, plaster.

* + - * 1. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

Insert other specific requirements as needed for work.

* + - 1. INSTALLATION OF WOOD FURRING
				1. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

Revise "Furring to Receive Plywood or Hardboard Paneling" Paragraph below if closer spacing is required for material fastened.

* + - * 1. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring [**horizontally**] [**and**] [**vertically**] at 24 inches o.c.

Revise "Furring to Receive (Gypsum Board) (Plaster Lath)" Paragraph below if closer spacing is required for material fastened.

* + - * 1. Furring to Receive [**Gypsum Board**] [**Plaster Lath**]: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

If framing is minor in scope and importance, delete remaining framing installation articles. Review framing requirements for compliance with local building code.

* + - 1. INSTALLATION OF WALL AND PARTITION FRAMING
				1. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions[**and for load-bearing partitions where framing members bearing on partition are located directly over studs**]. Fasten plates to supporting construction unless otherwise indicated.

Retain one of two stud sizes and one of four spacings in first subparagraph below; third and fourth stud spacings are for SI (metric) module.

For exterior walls, provide [**2-by-6-inch nominal-**] [**2-by-4-inch nominal-**] size wood studs spaced [**24 inches**] [**16 inches**] o.c. unless otherwise indicated.

Retain one of three stud sizes and one of four spacings in first subparagraph below; third and fourth stud spacings are for SI (metric) module.

For interior partitions and walls, provide [**2-by-6-inch nominal-**] [**2-by-4-inch nominal-**] [**2-by-3-inch nominal-**] size wood studs spaced [**24 inches**] [**16 inches**] o.c. unless otherwise indicated.

Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

* + - * 1. Construct corners and intersections with three or more studs[**, except that two studs may be used for interior non-load-bearing partitions**].
				2. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

Two subparagraphs below refer to load-bearing and non-load-bearing construction. Designate load-bearing walls on Drawings if retaining this distinction. Revise either subparagraph, or both, if single-jamb studs are acceptable.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.

For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated[**or, if not indicated, according to Table R502.5(1) or Table R502.5(2), as applicable, in the Uniform Code's International Residential Code for One- and Two-Family Dwellings**].

Retain paragraph below unless sheathing provides required bracing. If retaining second option below, indicate locations on Drawings. Change "bracing" to "wind bracing," "seismic bracing," and so forth, to match term used in code, where applicable.

* + - * 1. Provide diagonal bracing in [**exterior walls, at both walls of each external corner**] [**walls, at locations indicated**], at 45-degree angle, full-story height unless otherwise indicated. Use [**1-by-4-inch nominal- size boards, let-in flush with faces of studs**] [**metal wall bracing, let into studs in saw kerf**].

Insert requirements for framing gables, bays, and other special conditions or indicate on Drawings.

* + - 1. INSTALLATION OF FLOOR JOIST FRAMING
				1. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:

Where supported on wood members, by[**toe nailing or by**] using metal framing anchors.

Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.

* + - * 1. Fire Cuts: At joists built into masonry, bevel cut ends 3 inches and do not embed more than 4 inches.
				2. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches.
				3. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than one-third depth of joist; do not locate closer than 2 inches from top or bottom.
				4. Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.
				5. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.
				6. Anchor members paralleling masonry with 1/4-by-1-1/4-inch metal strap anchors spaced not more than 96 inches o.c., extending over and fastening to three joists. Embed anchors at least 4 inches into grouted masonry with ends bent at right angles and extending 4 inches beyond bend.
				7. Provide solid blocking between joists under jamb studs for openings.
				8. Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.

Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.

Revise paragraph below to suit various building code requirements. Below is based on the IBC.

* + - * 1. Provide bridging of type indicated below, at intervals of 96 inches o.c., between joists.

Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- size lumber, double-crossed and nailed at both ends to joists.

Steel bridging installed to comply with bridging manufacturer's written instructions.

* + - 1. INSTALLATION OF CEILING JOIST AND RAFTER FRAMING
				1. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

Delete subparagraph below if not applicable. This condition requires subflooring or stringers, as specified, to provide cross-tie.

Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- size or 2-by-4-inch nominal- size stringers spaced 48 inches o.c. crosswise over main ceiling joists.

* + - * 1. Rafters: Notch to fit exterior wall plates and[**toe nail or**] use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against valley rafters.

At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against hip rafter.

First paragraph below is recommended. Delete if not required.

* + - * 1. Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- size boards between every third pair of rafters, but not more than 48 inches o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.
				2. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.
			1. INSTALLATION OF TIMBER FRAMING
				1. Install timber beams with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.
				2. Where beams or girders are framed into pockets of exterior concrete or masonry walls, provide 1/2-inch airspace at sides and ends of wood members.
				3. Install wood posts using metal anchors indicated.
				4. Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.
			2. INSTALLATION OF STAIR FRAMING
				1. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:

"Size," "Material," "Notching," and "Spacing" subparagraphs below are examples only. Revise to suit Project and design loads required by building code. Treads and risers are finish carpentry.

Size: 2-by-12-inch nominal size, minimum.

Material: [**Laminated-veneer lumber**] [**parallel-strand lumber**] [**or**] [**solid lumber**].

Notching: Notch rough carriages to receive treads, risers, and supports; leave at least 3-1/2 inches of effective depth.

Spacing: At least three framing members for each 36-inch clear width of stair.

Paragraph below is an example only based on NFPA 101 requirements. Revise if more stringent tolerances are required. Coordinate with installation requirements for treads and risers in Section 062023 "Interior Finish Carpentry."

* + - * 1. Provide stair framing with no more than 3/16-inch variation between adjacent treads and risers and no more than 3/8-inch variation between largest and smallest treads and risers within each flight.
			1. PROTECTION

Delete this article if site-applied boron treatment is specified in Section 313116 "Termite Control."

* + - * 1. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

Retain paragraph below if borate treatment of wood that has become wet is used to help prevent mold and mildew.

* + - * 1. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes [**wet**] [**wet enough that moisture content exceeds that specified**], apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000