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TABLE 53-XVII
MINIMUM BOARD GRADES†

Grading Agency	Solid Floor or Roof Sheathing	Spaced Roof Sheathing
West Coast Lumber Inspection Bureau.....	Utility	Standard
Western Wood Products Association	4 Common or Utility	3 Common or Standard
Southern Pine Inspection Bureau.....	No. 3	No. 2
Redwood Inspection Service.....	Merchantable	Construction, common
National Lumber Grades Authority	4 Common or Utility	3 Common or Standard
Northern Hardwood and Pine Manufacturers Association.....	4 Common	3 Common
Northeastern Lumber Manufacturers Association.....	4 Common	3 Common

†The above grades are taken from grading rules approved by the American Lumber Standards Committee.

(8) **TIMBER FASTENERS.** The design and use of timber fasteners shall be in accordance with the requirements of National Design Specification for Wood Construction [Ind 51.27 (8)].

(9) **WOOD FOUNDATIONS AND WALLS BELOW GRADE.** (a) *Design.* The design of wood foundations and walls below grade shall be in accordance with the following adopted standard and listed exceptions: "All-Weather Wood Foundation System, Basic Requirements," Technical Report No. 7 [Ind 51.27 (8)].

1. **Exceptions:**

a. Section 3.3.1. Fasteners for use in preservative treated wood shall meet the requirements of this article. Fasteners of silicon bronze or copper or stainless steel types 304 or 316, as defined by the American Iron and Steel Institute classification, shall be permitted in preservative treated wood above or below grade. Fasteners or fastener materials not otherwise permitted under this article shall be permitted if adequate comparative tests for durability, including the effects associated with wood treating chemicals, demonstrate performance equal to or greater than the specified fasteners or fastener materials.

b. Section 6.7. Six-mil thick polyethylene sheeting shall be applied over the below-grade portion of exterior basement walls prior to back-filling. Joints in the polyethylene sheeting shall be lapped 6 inches and bonded. The top edge of the polyethylene sheeting shall be bonded to the plywood sheathing. A treated lumber or plywood strip shall be attached to the wall to cover the top edge of the polyethylene sheeting. The wood strip shall extend several inches above and below finish grade level, as required to protect the polyethylene from exposure to light and from mechanical damage at or near grade. The joint between the strip and the wall shall be caulked full length prior to fastening the strip to the wall. Alternatively, asbestos-cement board, brick, stucco or other covering appropriate to the architectural treatment may be used in place of the wood strip. The polyethylene sheeting shall extend down to the bottom of the wood footing plate but shall not overlap or extend into the gravel footing.

(b) *Materials.* All lumber and plywood shall be treated in accordance with the following adopted standard and shall be identified as to conformance with such standard by an approved inspection agency:

1. "Quality Control Program for Soft-Wood Lumber, Timber and Ply-wood Pressure Treated with Water-Borne Preservatives for Ground Contact Use in Residential and Light Commercial Foundations" [Ind 51.27 (6a)].

History: Cr. Register, July, 1974, No. 223, eff. 1-1-75; am. (2) Register, December, 1974, No. 228, eff. 1-1-75; r. and recr. (2), Register, April, 1975, No. 232, eff. 5-1-75; am. (1) (a), (3) and (8) (intro.), cr. (9), Register, December, 1978, No. 276, eff. 1-1-79.

Ind 53.62 Special systems. (1) WOOD TRUSSES. Wood trusses shall be constructed in accordance with the following recommended standard and the listed exceptions:

(a) "Design Specifications for Light Metal Plate Connected Trusses" [Ind 51.27 (10)].

1. Exceptions and additions:

a. Section 301.2. Moment coefficients used in design of top or bottom chord members shall be based on the assumption of no fixity at member ends or joints due to plate connectors.

b. Metal plate connectors shall be identifiable as stated in Ind 53.61 (8) (a).

c. The modification of design stresses for duration of load shall be as specified in Ind 53.61 (1) (a) 1.c.

(b) For trusses with nail-glued plywood gusset plates, calculations and design reference source shall be submitted to the department.

(c) Mechanically fastened trusses shall conform to part 8.4, "Timber Connector Joints," of National Design Specification [Ind 51.27 (8)].

History: Cr. Register, July, 1974, No. 223, eff. 1-1-75; cr. (1) (a) 1.c., Register, December, 1974, No. 228, eff. 1-1-75; am. (1) (c), Register, December, 1978, No. 276, eff. 1-1-79.

Ind 53.63 Minimum construction requirements. The requirements of this section shall apply to all wood framing.

Note: Recognized wood framing and construction details indicated in "Wood Construction Data No. 1 and No. 5" of the National Forest Products Association, Technical Services Division (1619 Massachusetts Ave. NW, Washington, D.C. 20036) is recommended as good design and construction practice.

(1) FIRE STOPS. Fire stops shall be provided at all intersections of interior and exterior walls with floors, ceilings and roof in such manner as to effectively cut off communication by fire through hollow concealed spaces and prevent both vertical and horizontal drafts.

(a) Furred walls shall have fire stops placed immediately above and below the junction of any floor construction with the walls, or shall be fire-stopped the full depth of the joist.

(b) All spaces between chimney and wood framing shall be solidly filled with noncombustible material at floor levels.

(c) All wood fire stops as required in this section shall be lumber not less than 2 inches in nominal thickness, or 3/4-inch thick plywood with joints backed, and not less in width than the enclosed space within the

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partition except as provided for chimneys. Fire stops may also be of gypsum board, cement asbestos board, mineral wool or other approved noncombustible materials, securely fastened in place.

(2) WOOD FRAMING INTO FIRE-RATED MASONRY WALLS. See Ind 51.045 (1) (m).

(3) FIRE-CUTTING. Wood members supported in masonry walls shall have the ends of such members played or firecut to allow free end rotation in the vertical plane of the member, out of the masonry wall. See also Ind 53.34 (3) (b) 5.b.

(4) BEARING. (a) *Joists and trusses*. The ends of each joist or truss shall have not less than 1½-inch length of bearing on wood or metal nor less than 3-inch length on hollow or solid masonry units.

(b) *Beams and girders*. The ends of beams or girders supported on masonry or concrete shall have not less than 4-inch length of bearing. See also Ind 53.34 (3).

(5) NOTCHING AND DRILLING. No notching of outer fibers of structural members is permitted unless substantiated by design calculations. Circular holes bored in joists and studs that are within the middle one-third of the depth of joist or studs are permitted without design calculations.

(6) DECAY PREVENTION. Where wood is used in parts of a building exposed to moisture that causes the moisture content of wood to exceed 19%, the wood shall be adequately ventilated or treated with preservative.

Note: The department will accept wood products treated in accordance with the standards of the American Wood Preservers Association and the American Wood Preservers Bureau.

(a) All wood columns, posts and frame legs whose base is subject to deterioration due to moisture shall bear on concrete or other inorganic materials which extend at least 3 inches above the adjacent surface unless treated with preservative.

(b) The ends of wood structural members built into exterior masonry walls or into concrete shall be treated with preservative or a moisture-proof barrier shall be installed on the bearing surface.

Note: In areas subject to termite attack, refer to "Design of Wood Structures for Permanence" (published by the National Forest Products Association, 1619 Massachusetts Ave. NW, Washington, D. C. 20036) as suggested by National Design Specifications [Ind 51.27 (8)], Appendix F, section B.2.

(7) TRUSS BRACING AND ANCHORAGE. All wood trusses shall be securely fastened to the supports and each truss shall be secured in position in accordance with National Design Specifications [Ind 51.27 (8)], Appendix F, section J.

(8) ANCHORAGE. Anchorage shall be in accordance with subsection Ind 53.12 (2).

(9) CROSS BRIDGING. Cross bridging shall be furnished in accordance with paragraph 300-J of NDS [Ind 51.27 (8)]. When joists support floor or roof decks other than wood or wood decks which are not adequately attached, cross bridging shall be provided at 8-foot intervals.

(10) **SOLID BLOCKING.** All floor and roof joists shall be supported laterally at the ends and at each support by solid blocking except when the ends of joists are nailed to a header, band or rim joist or to an adjoining stud. Solid blocking shall be provided between floor joists where subjected to concentrated loads. Solid blocking shall be not less than 2 inches in nominal thickness and the full depth of the joist.

(11) **JOIST SUPPORT.** Floor or roof joists shall not be toe nailed into the side of beams and girders for support. Such joists shall be supported by joist hangers, ledgers or metal plate connectors of adequate structural capacity.

(12) **STUD WALLS.** Unless evidence is provided to indicate otherwise, the maximum spacing and height of studs shall be in accordance with Table 53-XVIII. Notching and drilling of studs shall conform to subsection Ind 53.63 (5). Where load-bearing studs are spaced at 24-inch intervals, the roof trusses, rafters, and joists shall be centered over the studs or, in lieu thereof, solid blocking equal in size to the studs shall be installed to reinforce the double plate above.

(13) **MINIMUM RECOMMENDED NAILING SCHEDULE.** Unless evidence of design for the connection is provided, the connection shall have a minimum nailing in accordance with Table 53-XIX or its equivalent.

**TABLE 53-XVIII
MAXIMUM SPACING AND HEIGHT OF STUDS**

Size	Grade Referring to Fb and Fc	Height (Feet)	Spacing (Inches)	
			Exterior or Load-Bearing	Interior & Non- Load-Bearing
2 by 4 or larger	Utility	8	16	24
2 by 3.....	Standard and better...	8	16	16
2 by 4—3 by 4.....	Standard and better...	12	16	24
2 by 6 or larger	Standard and better...	18	24	24

TABLE 53-XIX
MINIMUM RECOMMENDED NAILING SCHEDULE

Connection	Nailing (using common nails)
Joist to sill or girder, toe nail.....	3-8d
Bridging to joist, toe nail each end.....	2-8d
Ledger strip.....	3-16d at each joist
1" x 6" subfloor or less to each joist, face nail.....	2-8d
Over 1" x 6" subfloor to each joist, face nail.....	3-8d
2" subfloor to joist or girder, blind and face nail.....	2-16d
Sole plate to joist or blocking, face nail.....	16d at 16" oc
Top plate to stud, end nail.....	2-16d
Stud to sole plate, toe nail.....	4-8d
Doubled studs, face nail.....	16d at 24" oc
Doubled top plates, face nail.....	16d at 16" oc
Top plates, laps and intersections, face nail.....	2-16d
Continuous header, two pieces.....	16d at 16" oc along each edge
Ceiling joists to plate, toe nail.....	3-8d
Continuous header to stud, toe nail.....	4-8d
Ceiling joists, laps over partitions, face nail.....	3-16d
Ceiling joists to parallel rafters, face nail.....	3-16d
Rafter to plate, toe nail.....	3-8d
One-inch brace to each stud and plate, face nail.....	2-8d
1" x 8" sheathing or less to each bearing, face nail.....	2-8d
Over 1" x 8" sheathing to each bearing, face nail.....	3-8d
Built-up corner studs.....	16d at 24" oc
Built-up girders and beams.....	20d at 32" oc along each edge

History: Cr. Register, July, 1974, No. 223, eff. 1-1-75; am. (6) intro., Register, December, 1976, No. 252, eff. 1-1-77.

Ind 53.64* Wood foundations. Foundations for 2-story buildings of type 7 and 8 construction may be constructed of treated wood when the design is based upon the soil bearing values contained in section Ind 53.21 and the structural design is in accordance with the standards listed in section Ind 53.61. All pressure-treated wood and plywood shall be treated and identified in accordance with adopted standards of the American Wood Preservers Bureau [Ind 51.27 (6a)].

Note: Section Ind 51.02 (4) (b) 1. b. requires that exterior walls below the first floor structural system be counted as a story when constructed of materials other than masonry or concrete. Therefore, buildings utilizing wood foundations will be limited to 2 levels (one-story and basement, one-story and ground floor, or 2-story with wood frost wall).

History: Cr. Register, December, 1978, No. 276, eff. 1-1-79.