

# Floor Framing

## SECTION R501

### GENERAL

**R501.1 Application.** The provisions of this chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical and/or plumbing fixtures and equipment.

**R501.2 Requirements.** Floor construction shall be capable of accommodating all loads according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

**R501.3 Fire protection of floors.** Floor assemblies not required elsewhere in this code to be fire-resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8-inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

#### Exceptions:

- 1) Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with NFPA13D, or other approved equivalent sprinkler system.
- 2) Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
- 3) Portions of floor assemblies can be unprotected when the aggregate area of the unprotected portions do not exceed 80 square feet per story, or fire-blocking is installed in accordance with Section R302.11.1 along the perimeter of the unprotected portion to separate that portion from the remainder of the floor assembly.
- 4) Wood floor assemblies using dimension lumber or LVL structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

## SECTION R502

### WOOD FLOOR FRAMING

**R502.1 General.** Load-bearing dimension lumber for joists, beams and girders shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

#### R502.1.1 Preservative-treated lumber.

Preservatively treated dimension lumber shall also be identified as required by Section R317.2.

**R502.1.2 Blocking and sub flooring.** Blocking shall be a minimum of utility grade lumber. Sub flooring may be a minimum of utility grade lumber or No. 4 common grade boards.

**R502.1.3 End-jointed lumber.** Approved end-jointed lumber identified by a grade mark conforming to Section R501.2 may be used interchangeably with solid-sawn members of the same species and grade.

**R502.1.4 Prefabricated wood I-joists.** Structural capacities and design provisions for prefabricated wood I-joists shall be established and monitored in accordance with ASTM D 5055.

**R502.2 Design and construction.** Floors shall be designed and constructed in accordance with the provisions of this chapter, Figure R502.2 and Sections R317 and R318 or in accordance with AF&PA/NDS.

#### R502.2.1 Decks. (See Deck Handout)

**R502.3 Allowable joist spans.** Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters.

**R502.3.1 Sleeping areas and attic joists.** Table R502.3.1(1) shall be utilized to determine the maximum allowable span of floor joists that support sleeping areas and attics that are accessed by means of a fixed stairway provided that the design live load does not exceed 30 psf and the design dead load does not exceed 20 psf. The allowable span of ceiling joists that support attics utilized for limited storage or no storage shall be determined in accordance with Section R802.4.

**R502.3.2 Other floor joists.** Table R502.3.1(2) shall be utilized to determine the maximum allowable span of floor joists that support all areas of the building, other than sleeping and attics, provided that the design live load does not exceed 40 psf and the design dead does not exceed 20 psf.

**R502.4 Joists under bearing partitions.** Joists under parallel bearing partitions shall be doubled or a beam of adequate size to support the load shall be provided. Double joists that are separated to permit the installation of piping or vents shall be full depth solid blocked with lumber not less than 2 inches in nominal thickness spaced not more than 4 feet on center.

**R502.5 Allowable girder spans.** The allowable spans of girders fabricated of dimension lumber shall not exceed the values set forth in Tables R502.5(1) and R502.5(2).

**R502.6 Bearing.** The ends of each joist, beam or girder shall have not less than 1.5 inches of bearing on wood or

metal and not less than 3 inches on masonry or concrete except where supported on a 1-inch by 4-inch ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers.

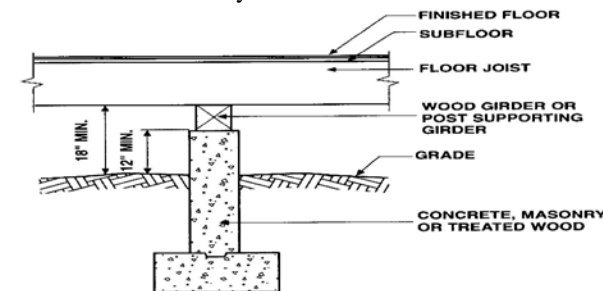
**R502.6.1 Floor systems.** Joists framing from opposite sides over a bearing support shall lap a minimum of 3 inches and shall be nailed together with a minimum three 10d face nails. A wood or metal splice with strength equal to or greater than that provided by the nailed lap is permitted.

**R502.6.2 Joist framing.** Joists framing into the side of a wood girder shall be supported by approved framing anchors or on ledger strips not less than nominal 2 inches by 2 inches.

**R502.7 Lateral restraint at supports.** Joists shall be supported laterally at the ends by full-depth solid blocking not less than 2 inches' nominal in thickness; or by attachment to a header, band, or rim joist, or to an adjoining stud; or shall be otherwise provided with lateral support to prevent rotation.

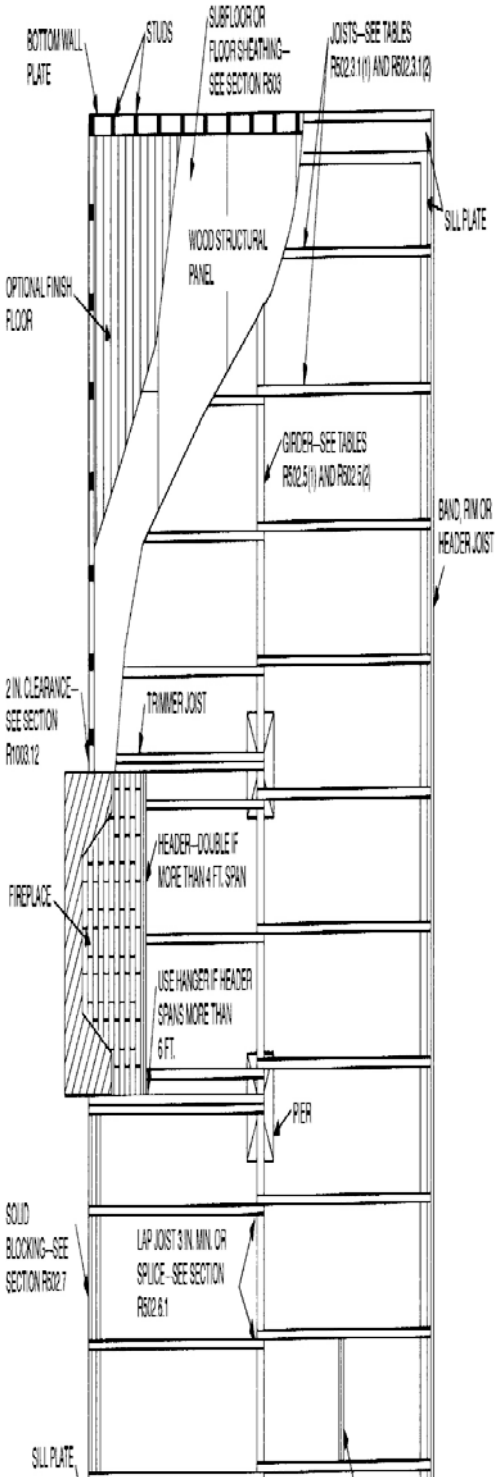
**R502.9 Fastening.** Floor framing shall be nailed in accordance with Table R602.3(1). Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.

**R502.10 Framing of openings.** Openings in floor framing shall be framed with a header and trimmer joists. When the header joist span does not exceed 4 feet, the header joist may be a single member the same size as the floor joist. Single trimmer joists may be used to carry a single header joist that is located within 3 feet of the trimmer joist bearing. When the header joist span exceeds 4 feet, the trimmer joists and the header joist shall be doubled and of sufficient cross section to support the floor joists framing into the header. Approved hangers shall be used for the header joist to trimmer joist connections when the header joist span exceeds 6 feet. Tail joists over 12 feet long shall be supported at the header by framing anchors or on ledger strips not less than 2 inches by 2 inches.



MINIMUM SEPARATION OF NONTREATED WOOD FROM GROUND

# Floor Framing



## City of Richmond

Department of Codes Enforcement  
 239 West Main Street  
 Richmond, KY 40475

(859) 625-6404

Monday – Friday  
 8:00 AM to 4:30 PM

