

# Wall Construction

## SECTION R601 GENERAL

**R601.1 Application.** The provisions of this chapter shall control the design and construction of all walls and partitions for all buildings.

**R601.2 Requirements.** Wall construction shall be capable of accommodating all loads imposed according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

### R601.2.1 Compressible Floor-covering Materials.

Compressible floor-covering materials that compress more than 1/32 inch when subjected to 50 pounds applied over 1 in. square of material and are greater than 1/8 in. in thickness in the uncompressed state shall not extend beneath walls, partitions or columns, which are fastened to the floor.

## SECTION R602 WOOD WALL FRAMING

**R602.1.1 Sawn Lumber.** Load-bearing dimension lumber for studs, plates and headers 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 certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

**R602.1.2 End-jointed Lumber.** Approved end-jointed lumber identified by a grade mark conforming to Section R602.1 may be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire-resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in the trademark.

**R602.2 Grade.** Studs shall be a minimum No. 3, standard or stud grade lumber.

### Exception:

- Bearing studs not supporting floors and nonbearing studs may be utility grade lumber, provided the studs are spaced in accordance with Table R602.3(5).

**R602.3 Design and construction.** Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA’s NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling, or

roof diaphragm or shall be designed in accordance with accepted engineering practice.

**R602.3.1 Stud, Size and Spacing.** The size, height, and spacing of studs shall be in accordance with Table R602.3(5).

### Exception:

- Utility grade studs shall not be spaced more than 16in. on center, shall not support more than a roof and ceiling, and shall not exceed 8ft. in height for exterior walls and loadbearing walls; or 10ft. for interior non-loadbearing walls.
- Studs more than 10ft. in height which are in accordance with Table R602.3.1.

**R602.3.2 Top plate.** Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least 24 in. Joints in plates need not occur over studs. Plates shall be not less than 2in. nominal thickness and have a width at least equal to the width of the studs.

### Exception:

- A single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and intersecting walls by a minimum 3in. by 6in. by a 0.036-inch-thick galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch. The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

**R602.3.3 Bearing studs.** Where joists, trusses or rafters are spaced more than 16 in. on center and the bearing studs below are spaced 24 in. on center, such members shall bear within 5 in. of the studs beneath.

### Exceptions:

- The top plates are two 2in. by 6in or two 3in by 4in. members.
- A third top plate is installed.
- Solid blocking equal in size to the studs is installed to reinforce the double top plate.

**R602.3.4 Bottom (sole) plate.** Studs shall have full bearing on a nominal 2in. or larger plate or sill having a width at least equal to the width of the studs.

**R602.4 Interior load-bearing walls.** Interior load-bearing walls shall be constructed, framed and fire-blocked as specified for exterior walls.

**R602.5 Interior nonbearing walls.** Interior nonbearing walls shall be permitted to be constructed with 2in. by 3in.

studs spaced 24 in. on center or, when not part of a braced wall line, 2in.by 4in. flat studs spaced at 16 in. on center. Interior nonbearing walls shall be capped with at least a single top plate. Interior nonbearing walls shall be fire-blocked in accordance with Section R602.8.

**TABLE R602.3(5)  
MAXIMUM STUD SPACING**

STUD SIZE (inches)	SUPPORTING ROOF AND CEILING ONLY (inches)	SUPPORTING ONE FLOOR ROOF AND CEILING (inches)	SUPPORTING TWO FLOORS ROOF AND CEILING (inches)	SUPPORTING ONE FLOOR ONLY (inches)
2 x 4	24 <sup>a</sup>	16	—	24 <sup>a</sup>
3 x 4	24 <sup>a</sup>	24	16	24
2 x 5	24	24	—	24
2 x 6	24	24	16	24

For SI: 1 inch = 25.4 mm.

- Shall be reduced to 16 inches if utility grade studs are used.

**TABLE R602.3(6)  
SIZE, HEIGHT AND SPACING OF WOOD STUDS<sup>a</sup>**

STUD SIZE (inches)	BEARING WALLS			NONBEARING WALLS	
	Maximum spacing when supporting a roof-ceiling assembly or a habitable attic assembly, only (inches)	Maximum spacing when supporting one floor, plus a roof-ceiling assembly or a habitable attic assembly (inches)	Maximum spacing when supporting two floors, plus a roof-ceiling assembly or a habitable attic assembly (inches)	Maximum spacing when supporting one floor height <sup>b</sup> (inches)	Laterally unsupported stud height <sup>c</sup> (feet)
2 x 3 <sup>b</sup>	—	—	—	—	—
2 x 4	24 <sup>c</sup>	—	—	—	10
3 x 4	24	16 <sup>c</sup>	—	24	14
2 x 5	24	24	16	24	14
2 x 6	24	24	—	24	16
			16	24	20
			—	24	24

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm.

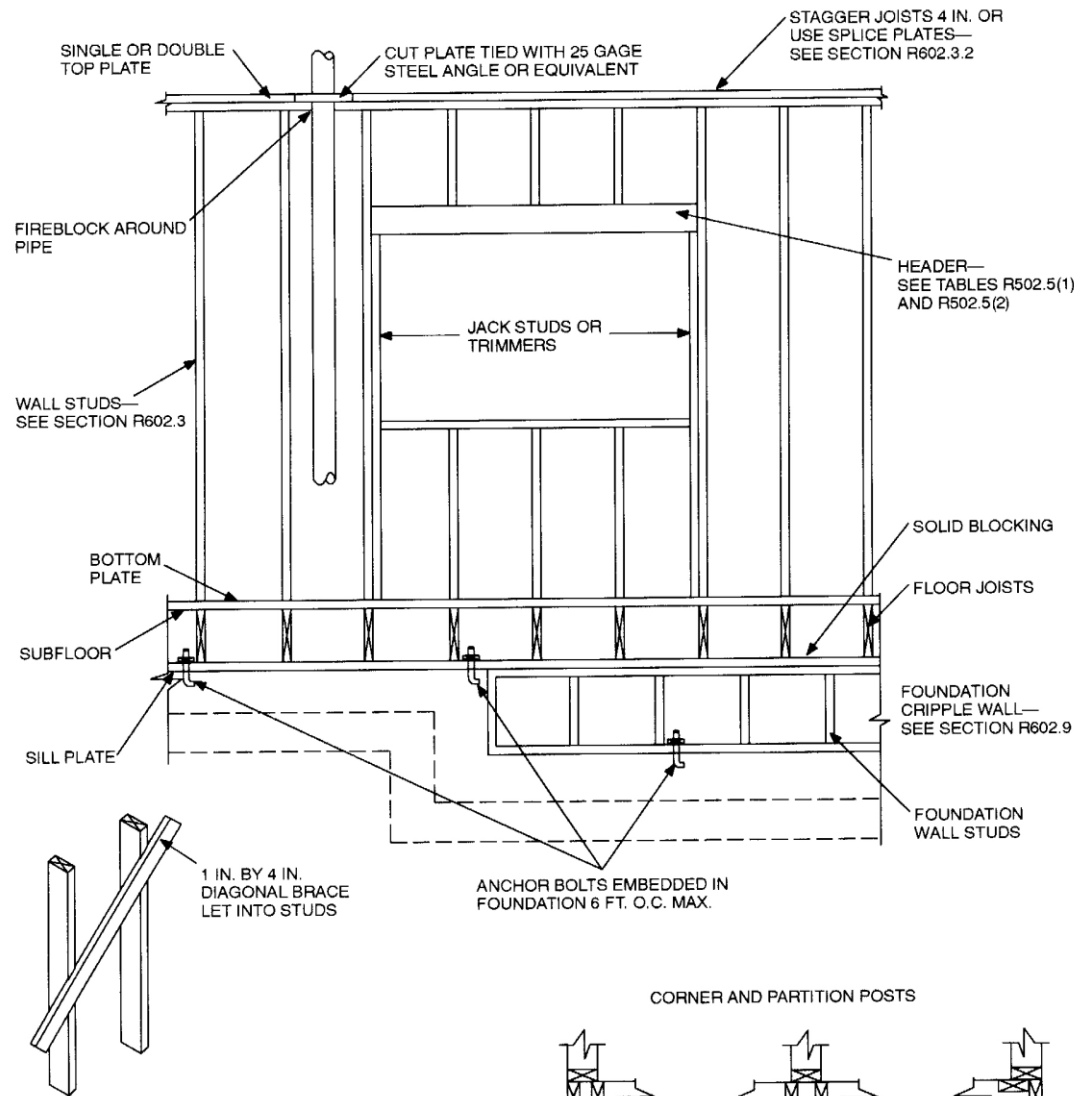
a. Lateral heights are distances between points of lateral support placed perpendicular to the plane of the wall. Bearing walls shall be sheathed on not less than one side or bridging shall be installed not greater than 4 feet apart measured vertically from either end of the stud. Increases in unsupported height are permitted where in compliance with Exception 2 of Section R602.3.1 or designed in accordance with accepted engineering practice.

b. Shall not be used in exterior walls.

c. A habitable attic assembly supported by 2 x 4 studs is limited to a roof span of 32 feet. Where the roof span exceeds 32 feet, the wall studs shall be increased to 2 x 6 or the studs shall be designed in accordance with accepted engineering practice.

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APPLY APPROVED SHEATHING OR BRACE EXTERIOR WALLS WITH 1 IN. BY 4 IN. BRACES LET INTO STUDS AND PLATES AND EXTENDING FROM BOTTOM PLATE TO TOP PLATE, OR OTHER APPROVED METAL STRAP DEVICES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. SEE SECTION R602.10.

NOTE: A THIRD STUD AND/OR PARTITION INTERSECTION BACKING STUDS MAY BE OMITTED THROUGH THE USE OF WOOD BACKUPS, CLEATS, METAL DRYWALL CLIPS OR OTHER APPROVED DEVICES THAT WILL SERVE AS AN ADEQUATE BACKING FOR THE FACING MATERIALS.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**FIGURE R602.3(2)**  
**FRAMING DETAILS**



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