

NARROW WALLS

THAT WORK



Min. 670 lb framing anchorsSM
(Ref. No. LTP4)

Nail sole plate to joist per table
R602.3(1)

Nail sole plate to joist per table
R602.3(1)



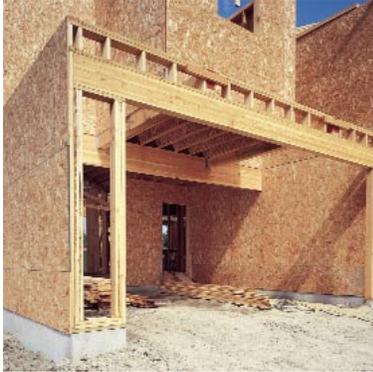
Framing or
manufacture

Approved Band Joist

Approve
Band Joist

A SIMPLE SOLUTION FOR MEETING NARROW WALL BRACING REQUIREMENTS

The APA Narrow Wall Bracing Method gives builders the architectural flexibility of 16-inch-wide narrow wall segments, the structural integrity of code-approved bracing, and the ease of site-built, hold-down-free construction.



Modern builders face the challenge of meeting the conflicting demands of the architect and owner, and the building officials. While the designer and homeowner want large windows and doors coupled with narrow wall segments between the openings, building officials want to make sure the home meets International Residential Code (IRC) bracing requirements. Those requirements could mean 48-inch-wide walls where the design shows only 16 inches. The APA Narrow Wall Bracing Method meets code bracing requirements while reducing wall segments to as narrow as 16 inches next to window and door openings and requires no special components or connectors.

The APA Narrow Wall Bracing Method is simple: Fully sheath the exterior walls with plywood or OSB and install a header that extends beyond the opening. A fully sheathed (or, in IRC terms, “continuously sheathed”) home provides superior structural performance over homes sheathed with non-structural products because the structural wood panels form a strong, stiff shell. Once lapped by wall sheathing, the header/sheathing combination forms a semi-moment-resisting frame, or portal frame, which provides superior resistance to wind and earthquake forces. By using this system, braced wall segments can be as narrow as 16 inches wide and hold-downs are not required. See Figures 1, 3, and 4 for construction details.

The APA Narrow Wall Bracing Method’s application over rigid foundations received code acceptance in the 2004 Supplement to the International Codes Section R602.10.6.2.

WHY IS WALL BRACING SO IMPORTANT?

The IRC addresses the structural needs of residences, and one such need is resistance to the natural forces acting against homes. Gravity is the vertical load that all homes are built to withstand, but homes must also resist lateral loads. Lateral loads, such as the forces induced by high wind or earthquakes, act in a horizontal direction on the walls of the home. Just as bearing walls and beams carry vertical loads, wall bracing and braced wall lines resist lateral loads, and just as a beam must be properly sized, so too must the wall bracing.

Modern homes are designed with taller walls, which catch more wind. They also have many windows, which decrease the force-resisting shell of the home. These elements mean wall bracing is more important today than it ever has been in the past. Proper wall bracing gives the home the ability to resist lateral load forces.





It's easy to see why designers and homeowners prefer narrow walls from the photo illustration comparing two IRC-approved wall bracing methods: fully sheathed and partially sheathed.

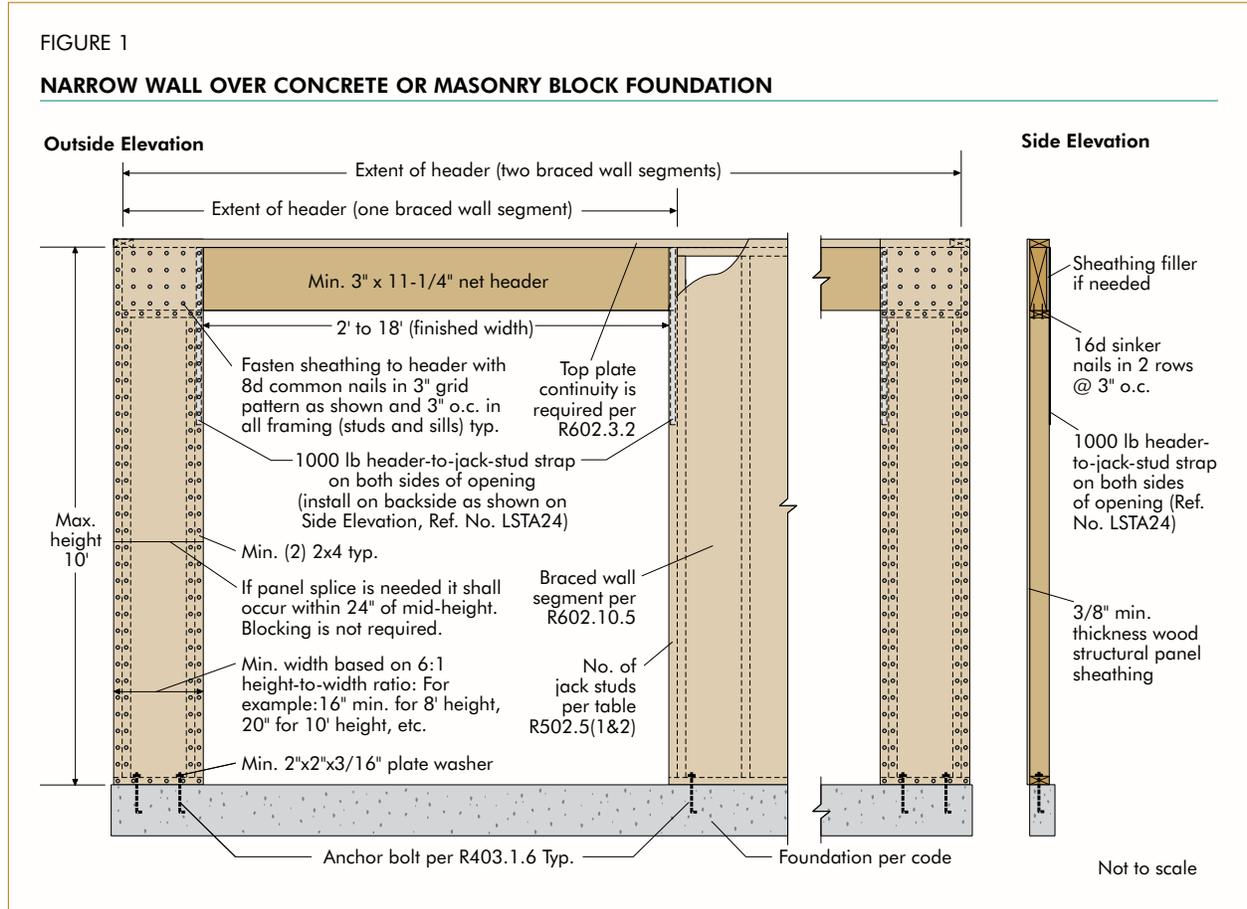
In the partially sheathed method, the IRC (Section R602.10) requires 4-foot-wide bracing segments near the corners of buildings and at prescribed intermediate points. Four-foot-wide bracing segments significantly reduce the wall space available for windows, doorways, and garage openings, making efficient house layout difficult for designers and homeowners alike.

Fortunately, the IRC permits narrow wall segments to count as bracing when the house is fully sheathed with wood structural panels. This bracing method, described in IRC Section R602.10.5, permits segments as narrow as 24 inches next to most windows. The APA method permits segments as narrow as 16 inches adjacent to openings such as garage doors, large windows, and sliding glass doors (see Table 1). This bracing option offers more design flexibility for houses, allowing more windows and doors, and making a lighter, more open-feeling interior.

CONSTRUCTION DETAILS FOR THE APA NARROW WALL BRACING METHOD

FIGURE 1

NARROW WALL OVER CONCRETE OR MASONRY BLOCK FOUNDATION

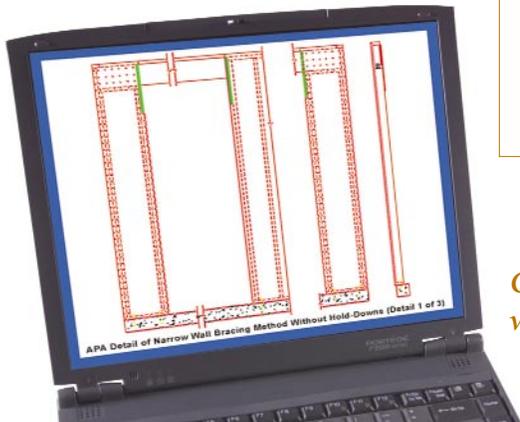
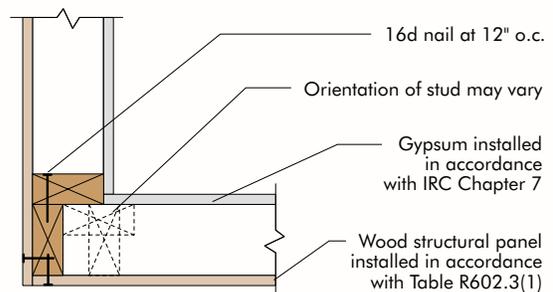


NOTE: This narrow wall bracing segment meets the minimum requirements for wall bracing (racking loads in the plane of the wall). The building designer should determine what specific details are necessary to provide a complete load path for using this bracing in the structure.

FIGURE 2

EXAMPLE OF OUTSIDE CORNER DETAIL

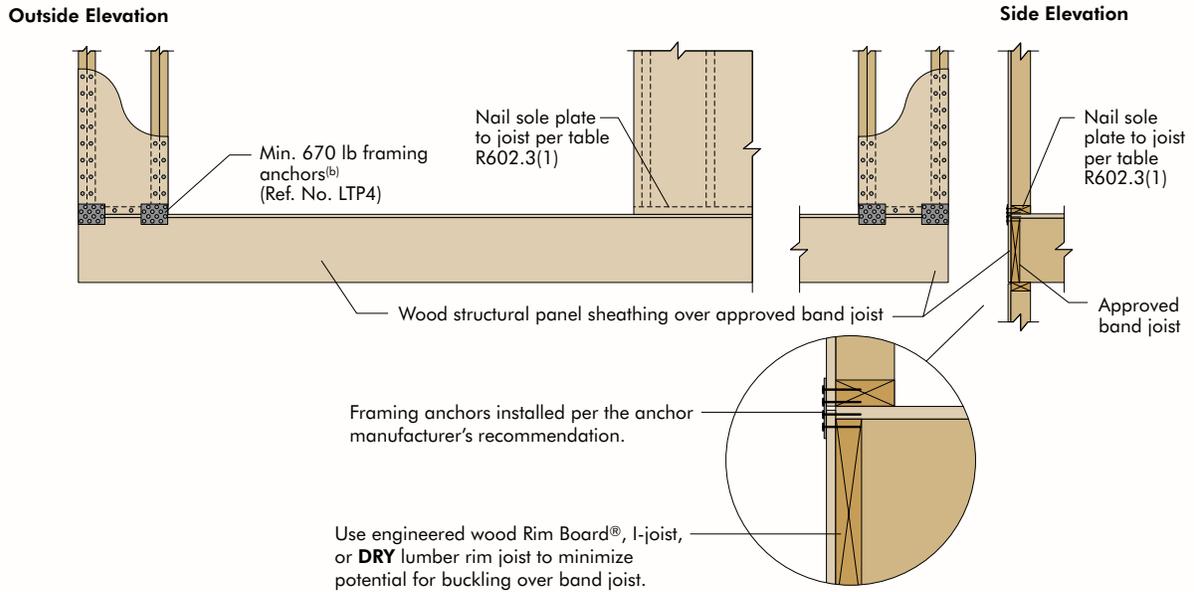
Connect the two walls together as outlined in this detail to provide overturning restraint. The fully sheathed wall line perpendicular to the narrow bracing segment helps reduce the overturning force because the overturning moment acts over a longer distance.



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FIGURE 3

NARROW WALL OVER RAISED WOOD FLOOR OR SECOND FLOOR – FRAMING ANCHOR OPTION^(a)



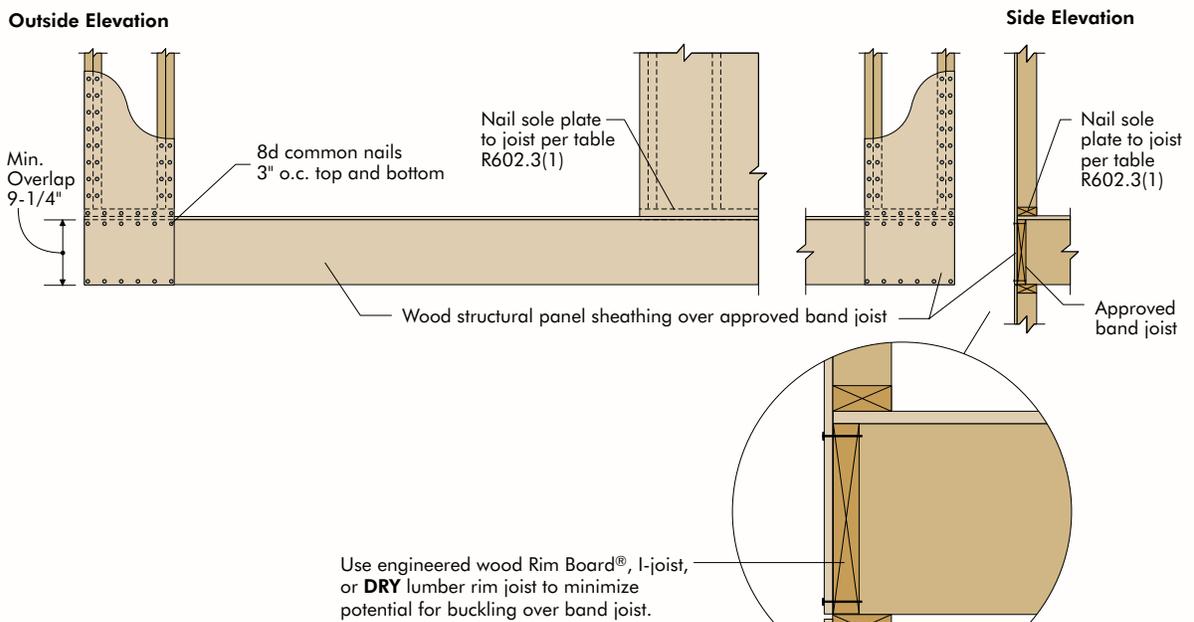
Notes:

- (a) See Figure 1 for complete framing detail.
- (b) Framing anchors may also be rotated vertically.

Not to scale

FIGURE 4

NARROW WALL OVER RAISED WOOD FLOOR OR SECOND FLOOR – WOOD STRUCTURAL PANEL OVERLAP OPTION^(a)



Note:

- (a) See Figure 1 for complete framing detail.

Not to scale

DESIGN FLEXIBILITY FOR THE WHOLE HOUSE

NARROW BRACING OPTIONS FOR A FULLY SHEATHED HOME

Because fully sheathing a home with plywood or OSB creates a rigid shell structure, the APA Narrow Wall Bracing Method and the continuously sheathed method referenced in Section R602.10.5 of the IRC solve the problem of meeting code requirements while permitting narrow walls. The IRC R602.10.5 method allows for wall segments as narrow as 24 inches, but the APA Narrow Wall Bracing Method takes the concept a step further with a configuration that adds enough structural support to safely reduce bracing width to 16 inches. Both methods can be used all around the house at garage, window, and door openings, creating a more pleasing appearance both inside and out. Table 1 summarizes minimum allowable bracing widths permitted by the IRC.

TABLE 1

ALLOWABLE BRACING SEGMENT WIDTHS FOR FULLY SHEATHED HOMES

| Bracing Construction | Minimum Width of Braced Wall Panel for Wall Height of: | | | Max. Opening Height Next to the Braced Wall |
|--|--|--------|---------|---|
| | 8 feet | 9 feet | 10 feet | |
| IRC R602.10.5 (see IRC for limitations) | 32" | 36" | 40" | 85% of wall height |
| | 24" | 27" | 30" | 65% of wall height |
| APA Narrow Wall^(a) Bracing Method (see Figures 1, 3, 4) | 16" | 18" | 20" | up to bottom of header |

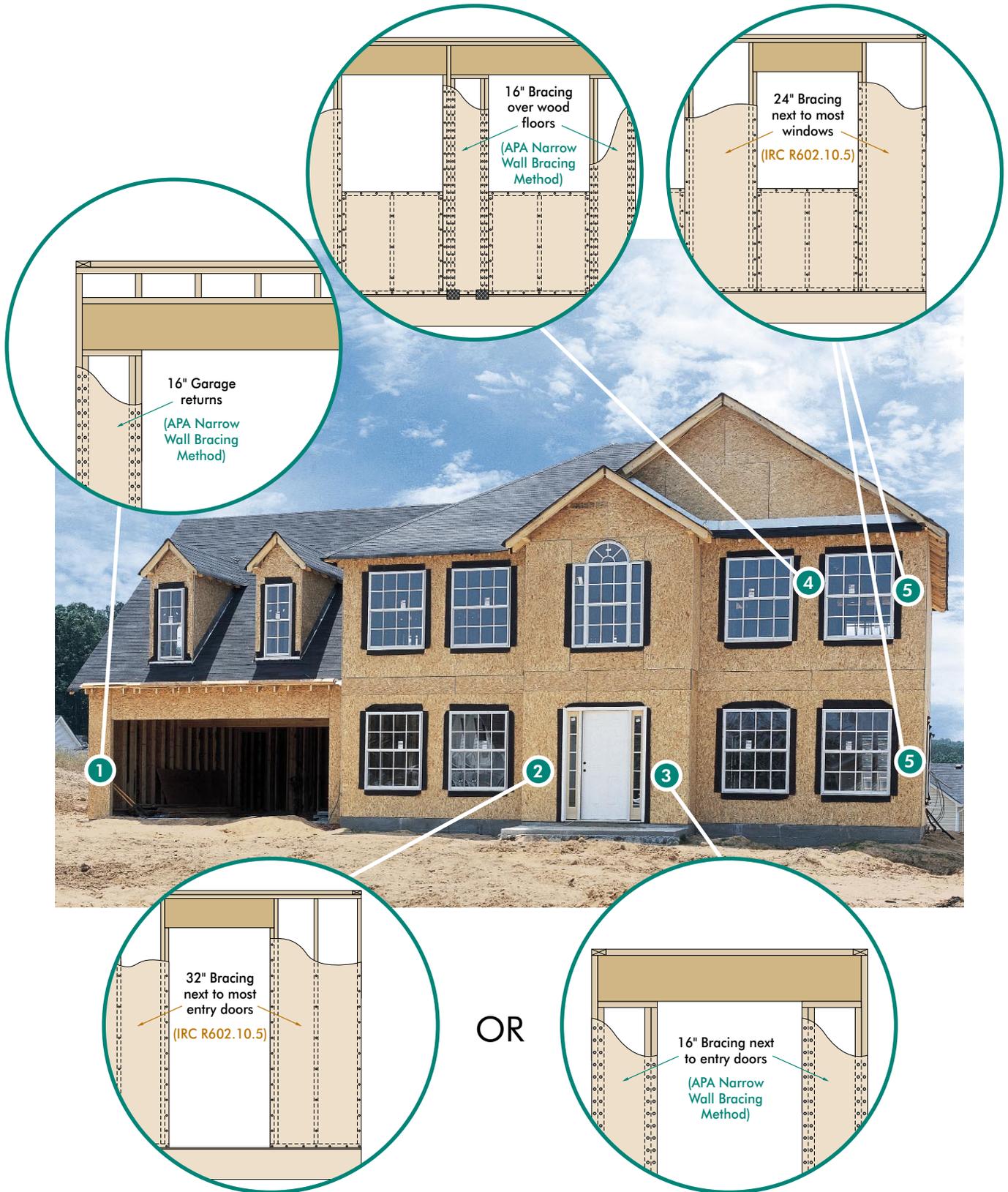
Note:

(a) The minimum width of braced wall segment for the APA Method is based on the height from the top of header to bottom of sill plate, as shown in Figure 1. Framing, such as a cripple wall, may be built on top of the header, but it does not affect the height used to determine the minimum braced wall segment width.

The illustration on page 7 shows five areas around the house in which narrow wall bracing can be used.

- 1 Builders can easily achieve 16-inch-wide garage return walls without using exotic systems or foundation hold-down devices. The APA Narrow Wall Bracing Method is currently recognized by the 2004 IRC Supplement in Section R602.10.6.2.
- 2 & 5 Using IRC R602.10.5, bracing segments can be as narrow as 32-inches wide next to entry doors and 24-inches wide next to most windows. No header extensions or special nailing schedules are necessary.
- 3 The APA Narrow Wall Bracing Method permits 16-inch-wide bracing segments next to entry doors and windows.
- 4 Builders can use 16-inch-wide bracing on raised wood floors such as over basements and crawl spaces, on second and third stories, and in sunrooms.

Note: Drawings are for illustrative purposes only. Use Figures 1, 3, and 4 and the IRC for construction details and limitations.



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