



## Standard Operating Procedures

SOP # 2006-01

Effective Date: Immediately

**Subject:** Alternate braced wall panel adjacent to door or window openings in exterior walls for buildings regulated by the International Residential Code (IRC).

Supersedes all previous S.O.P.s related to this requirements subject unless otherwise stated herein.

**Purpose:** The City of Coeur d'Alene is currently enforcing the 2003 IRC. This S.O.P. will authorize the use of the 2006 International Residential Code Section R602.10.6.2 provisions for exterior wall braced wall panels until the 2006 IRC is formally adopted.

**Procedure:** The design for the "Alternate braced wall panel adjacent to a door or window opening" must meet all the provisions of the 2006 IRC, Section R602.10.6.2 which is attached to this SOP.

Approval date: May 02, 2006

Expires: With the adoption of the 2006 IRC.

Edward J Wagner, Building Official  
Building Department

**R602.10.6.2 Alternate braced wall panel adjacent to a door or window opening.** Alternate braced wall panels constructed in accordance with one of the following provisions are also permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.4 for use adjacent to a window or door opening with a full-length header:

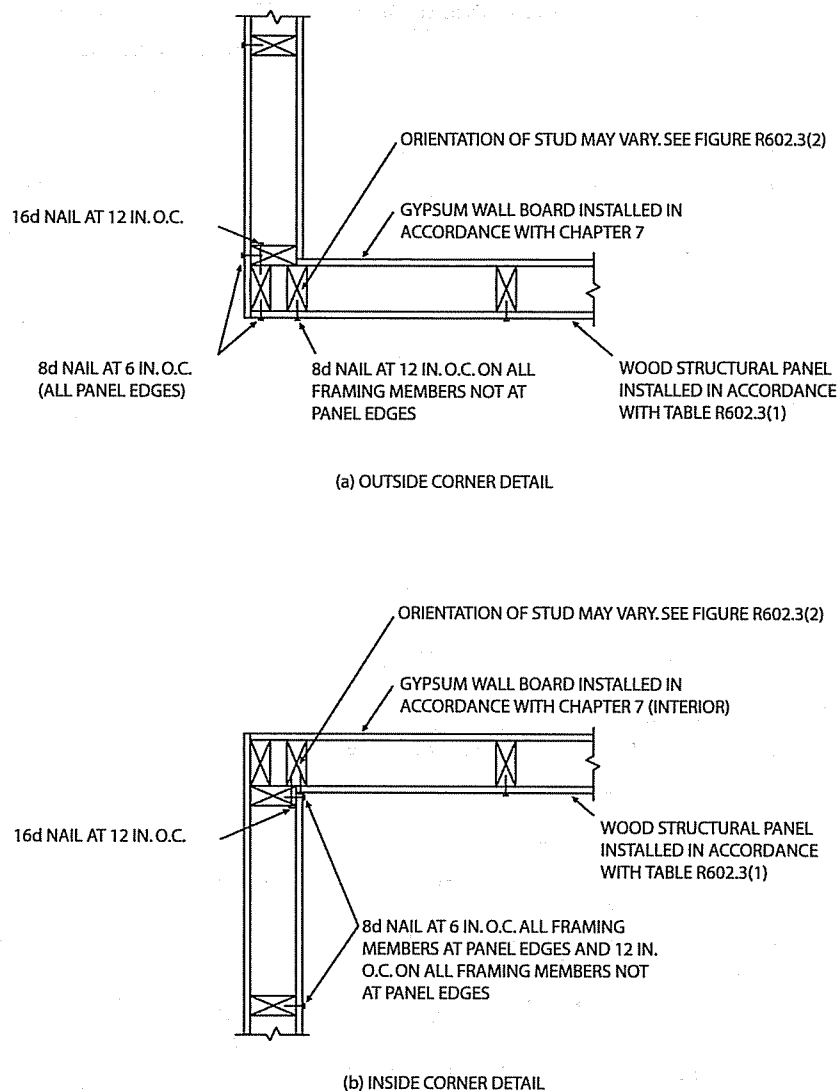
1. In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of  $\frac{3}{8}$ -inch-minimum-thickness (10 mm)

**TABLE R602.10.5**  
**LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN A CONTINUOUSLY SHEATHED WALL<sup>a, b, c</sup>**

MINIMUM LENGTH OF BRACED WALL PANEL (inches)			MAXIMUM OPENING HEIGHT NEXT TO THE BRACED WALL PANEL (% of wall height)
8-foot wall	9-foot wall	10-foot wall	
48	54	60	100
32	36	40	85
24	27	30	65

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square foot = 0.0479 kPa.

- a. Linear interpolation shall be permitted.
- b. Full-height sheathed wall segments to either side of garage openings that support light frame roofs only, with roof covering dead loads of 3 psf or less shall be permitted to have a 4:1 aspect ratio.
- c. Walls on either or both sides of openings in garages attached to fully sheathed dwellings shall be permitted to be built in accordance with Section R602.10.6.2 and Figure R602.10.6.2 except that a single bottom plate shall be permitted and two anchor bolts shall be placed at 1/3 points. In addition, tie-down devices shall not be required and the vertical wall segment shall have a maximum 6:1 height-to-width ratio (with height being measured from top of header to the bottom of the sill plate). This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C.



For SI: 1 inch = 25.4 mm.  
Gypsum board nails deleted for clarity.

**FIGURE R602.10.5**  
**TYPICAL EXTERIOR CORNER FRAMING FOR CONTINUOUS STRUCTURAL**  
**PANEL SHEATHING; SHOWING REQUIRED STUD-TO-STUD NAILING**

wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Figure R602.10.6.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.6.2. Use of a built-up header consisting of at least two 2 x 12s and fastened in accordance with Table R602.3(1) shall be permitted. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap

with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the side of the inner studs opposite the sheathing. One anchor bolt not less than  $\frac{5}{8}$ -inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be installed in the center of each sill plate. The studs at each end of the panel shall have a tie-down device fastened to the foundation with an uplift capacity of not less than 4,200 pounds (18 683 N).

Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the bearing

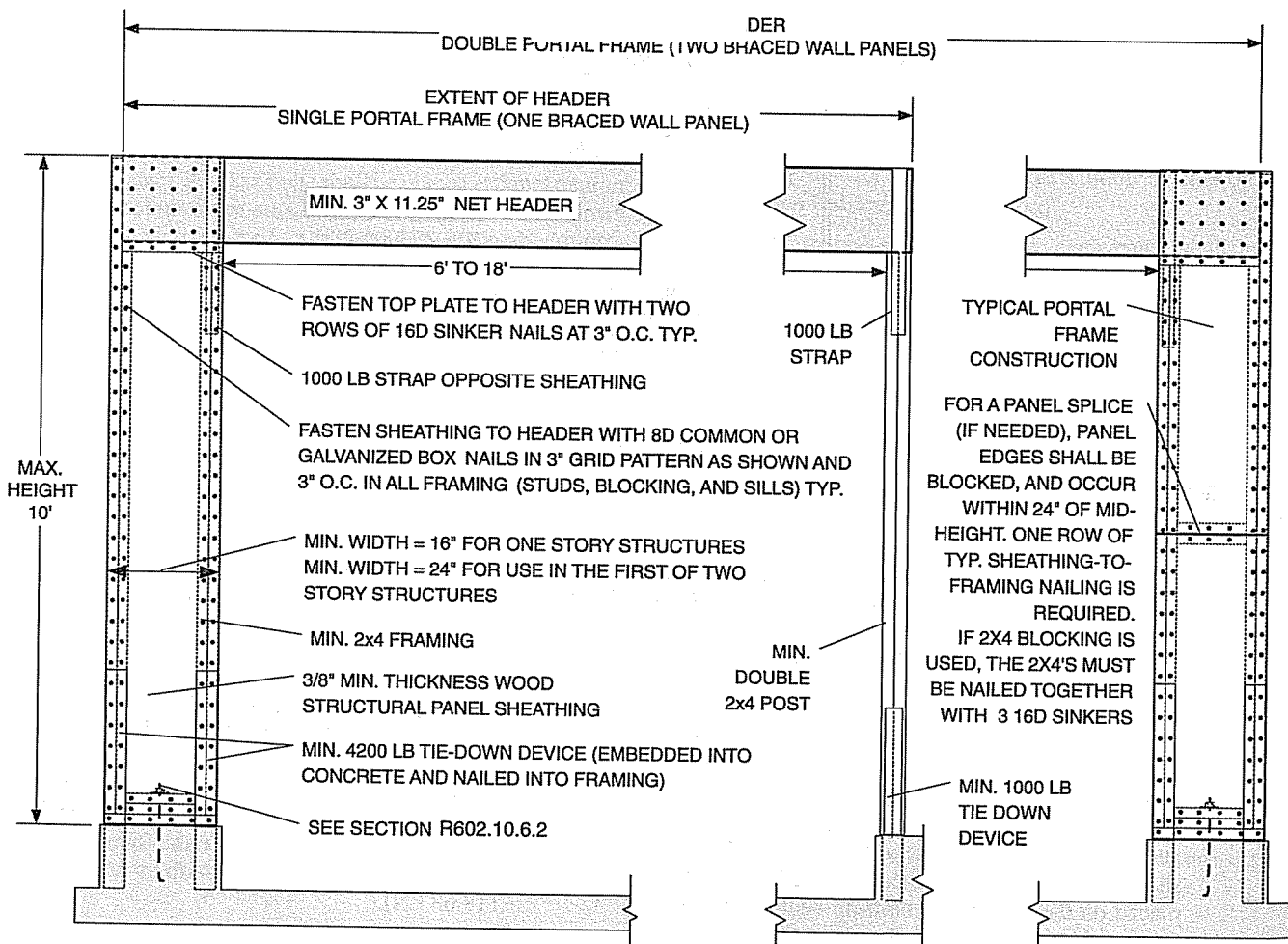


TABLE R602.10.6  
MINIMUM WIDTHS AND TIE-DOWN FORCES OF ALTERNATE BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WINDSPEED	TIE-DOWN FORCE (lb)	HEIGHT OF BRACED WALL PANEL				
		Sheathed Width				
		8 ft. 2' - 4"	9 ft. 2' - 8"	10 ft. 2' - 8"	11 ft. 3' - 2"	12 ft. 3' - 6"
SDC A, B, and C Windspeed < 110 mph	R602.10.6.1, Item 1	1800	1800	1800	2000	2200
	R602.10.6.1, Item 2	3000	3000	3000	3300	3600
SDC D <sub>0</sub> , D <sub>1</sub> and D <sub>2</sub> Windspeed < 110 mph	R602.10.6.1, Item 1	Sheathed Width				
		2' - 8"	2' - 8"	2' - 8"	Note a	Note a
	R602.10.6.1, Item 2	1800	1800	1800	—	—
	R602.10.6.1, Item 2	3000	3000	3000	—	—

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

a. Not permitted because maximum height is 10 feet.



A minimum 12-inch-by-12-inch continuous footing reinforced with 2 #4 bar, and a minimum of 2 #4 bar located at the top and bottom of the foundation wall.

FIGURE R602.10.6.2  
ALTERNATE BRACED WALL PANEL ADJACENT TO A DOOR OR WINDOW OPENING



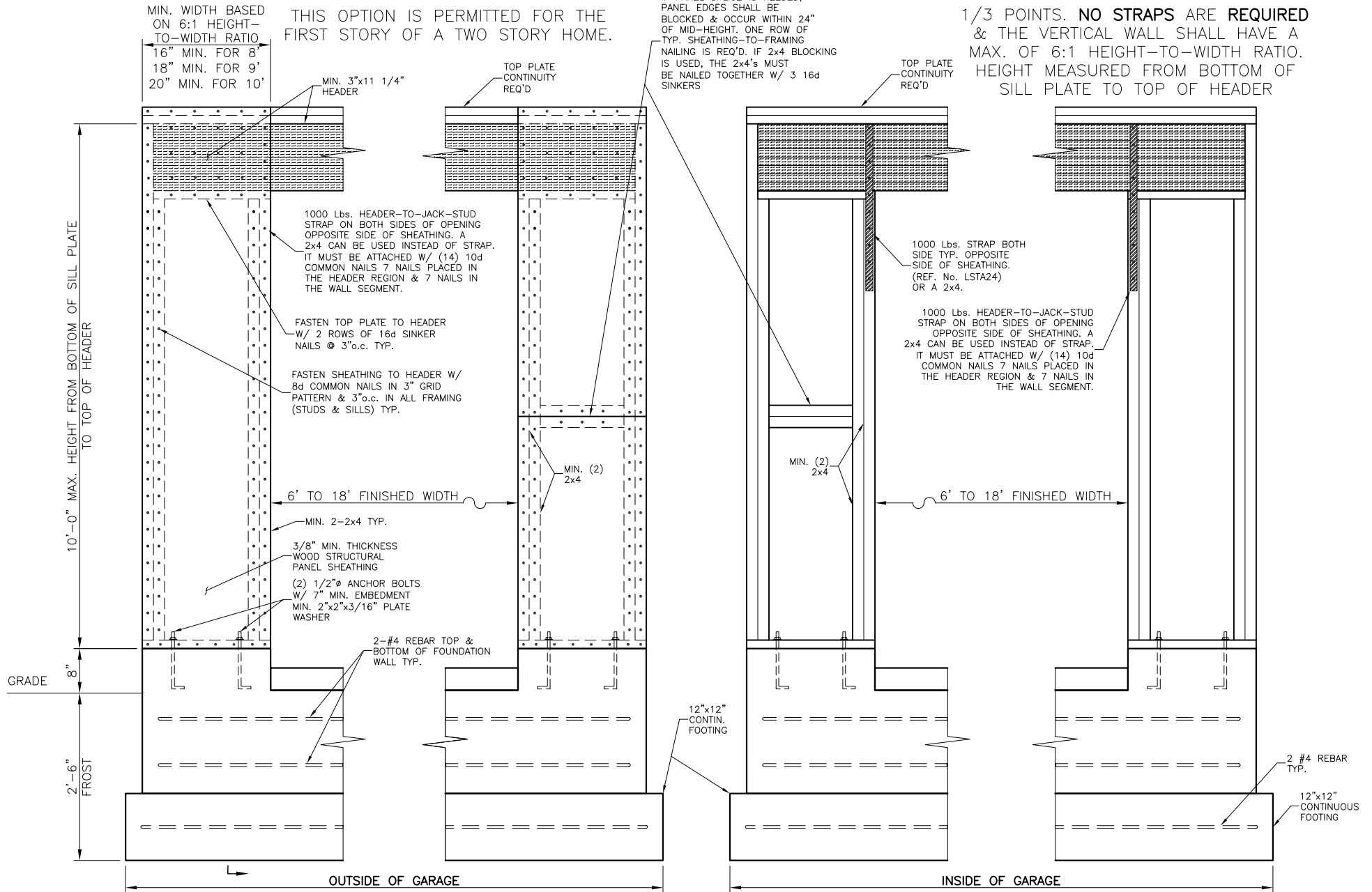
PER THE 2006 IRC  
 ALTERNATE BRACED WALL PANEL  
 ADJACENT TO A GARAGE DOOR OPENING

NOTE:

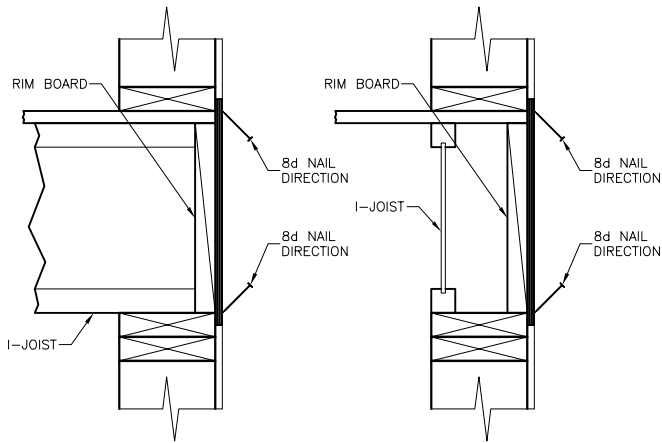
A SINGLE BOTTOM PLATE AND 2 ANCHOR BOLTS SHALL BE PLACED @ 1/3 POINTS. **NO STRAPS** ARE REQUIRED & THE VERTICAL WALL SHALL HAVE A MAX. OF 6:1 HEIGHT-TO-WIDTH RATIO. HEIGHT MEASURED FROM BOTTOM OF SILL PLATE TO TOP OF HEADER

THIS OPTION IS PERMITTED FOR THE FIRST STORY OF A TWO STORY HOME.

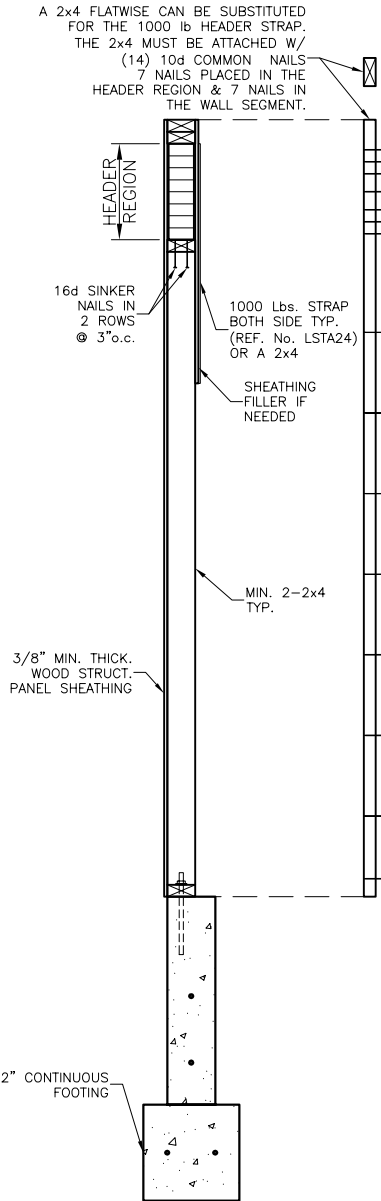
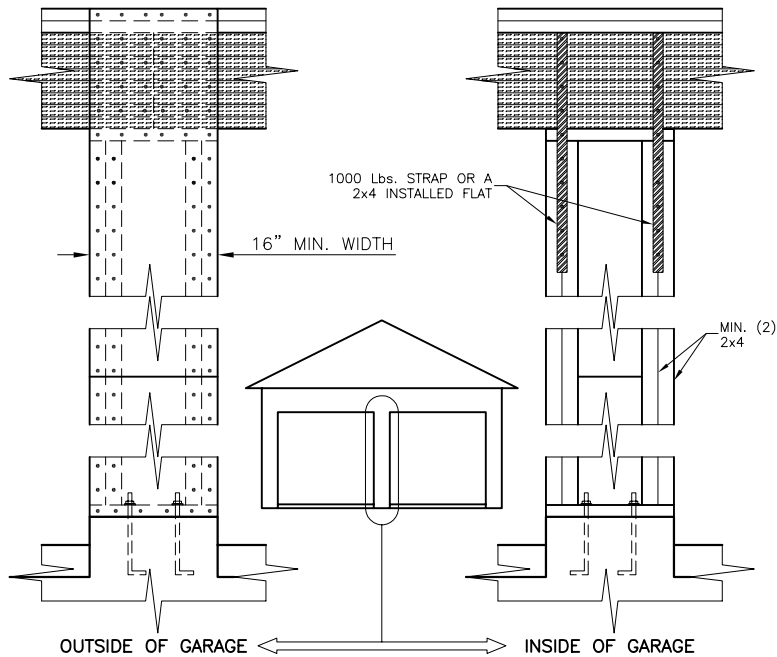
IF PANEL SPLICE IS NEEDED, PANEL EDGES SHALL BE BLOCKED & OCCUR WITHIN 24" OF MID-HEIGHT. ONE ROW OF TYP. SHEATHING-TO-FRAMING NAILING IS REQ'D. IF 2x4 BLOCKING IS USED, THE 2x4's MUST BE NAILED TOGETHER W/ 3 16d SINKERS



DETAIL  
 2006 IRC  
 6:1 RATIO



ADJOINING PANEL EDGES FROM FLOOR TO FLOOR



SECTION

PER THE APA  
TECHNICAL TOPICS  
FORM No. TT-080B

**NOTE:**  
A 2x4 FLATWISE MAY  
BE SUBSTITUTED FOR THE  
1000 lb HEADER STRAP.

PER THE 2006 IRC  
ALTERNATE BRACED WALL PANEL  
ADJACENT TO A GARAGE DOOR OPENING

THIS OPTION IS PERMITTED FOR THE  
FIRST STORY OF A TWO STORY HOME.

**NOTE:**

A SINGLE BOTTOM PLATE AND 2  
ANCHOR BOLTS SHALL BE PLACED @  
1/3 POINTS. **NO STRAPS ARE REQUIRED**  
& THE VERTICAL WALL SHALL HAVE A  
MAX. OF 6:1 HEIGHT-TO-WIDTH RATIO.  
HEIGHT MEASURED FROM BOTTOM OF  
SILL PLATE TO TOP OF HEADER



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# T E C H N I C A L T O P I C S

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Form No. TT-080B  
June 2005

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## FREQUENTLY ASKED QUESTIONS ABOUT APA'S NARROW WALL BRACING METHOD WITHOUT HOLD DOWNS

**Question 1.** Can a 2x4 flatwise be substituted for the 1000-lb header strap?

**Answer:** Yes, the 2x4 must be attached with 14-10d common nails (0.148" diameter). Seven nails should be placed in the header region and 7 nails should be placed in the wall segment. Other engineering alternatives are also possible.

studs. The bearing studs shall also have a tie-down device fastened to the foundation with an uplift capacity of not less than 1000 pounds (4448 N).

The tie-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation which is continuous across the entire length of the braced wall line. The foundation shall be reinforced with not less than one No. 4 bar top and bottom.

Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

2. In the first story of two-story buildings, each wall panel shall be braced in accordance with Item 1 above, except that each panel shall have a length of not less than 24 inches (610 mm).

**R602.10.7 Panel joints.** All vertical joints of panel sheathing shall occur over, and be fastened to, common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to, common blocking of a minimum 1½ inch (38 mm) thickness.

**Exception:** Blocking is not required behind horizontal joints in Seismic Design Categories A and B and detached dwellings in Seismic Design Category C when constructed in accordance with Section R602.10.3, braced-wall-panel construction method 3 and Table R602.10.1, method 3, or where permitted by the manufacturer's installation requirements for the specific sheathing material.

**R602.10.8 Connections.** Braced wall line sole plates shall be fastened to the floor framing and top plates shall be connected to the framing above in accordance with Table R602.3(1). Sills shall be fastened to the foundation or slab in accordance with Sections R403.1.6 and R602.11. Where joists are perpendicular to the braced wall lines above, blocking shall be provided under and in line with the braced wall panels. Where joists are perpendicular to braced wall lines below, blocking shall be provided over and in line with the braced wall panels. Where joists are parallel to braced wall lines above or below, a rim joist or other parallel framing member shall be provided at the wall to permit fastening per Table R602.3(1).

**R602.10.9 Interior braced wall support.** In one-story buildings located in Seismic Design Category D<sub>2</sub>, interior braced wall lines shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two-story buildings located in Seismic Design Category D<sub>2</sub>, all interior braced wall panels shall be supported on continuous foundations.

**Exception:** Two-story buildings shall be permitted to have interior braced wall lines supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:

1. The height of cripple walls does not exceed 4 feet (1219 mm).
2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

**R602.10.10 Design of structural elements.** Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

**R602.10.11 Bracing in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.** Structures located in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall have exterior and interior braced wall lines.

**R602.10.11.1 Braced wall line spacing.** Spacing between braced wall lines in each story shall not exceed 25 feet (7620 mm) on center in both the longitudinal and transverse directions.

**Exception:** In one- and two-story buildings, spacing between two adjacent braced wall lines shall not exceed 35 feet (10 363 mm) on center in order to accommodate one single room not exceeding 900 square feet (84 m<sup>2</sup>) in each dwelling unit. Spacing between all other braced wall lines shall not exceed 25 feet (7620 mm).

**R602.10.11.2 Braced wall panel location.** Exterior braced wall lines shall have a braced wall panel at each end of the braced wall line.

**Exception:** For braced wall panel construction Method 3 of Section R602.10.3, the braced wall panel shall be permitted to begin no more than 8 feet (2438 mm) from each end of the braced wall line provided the following is satisfied:

1. A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch (610 mm) panels at the corner shall be attached to framing in accordance with Figure R602.10.5; or
2. The end of each braced wall panel closest to the corner shall have a tie-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The tie-down device shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8 kN). The tie-down device shall be installed in accordance with the manufacturer's recommendations.