

RB197-06/07

R602.10.3.1 (New)

Proposed Change as Submitted:

Proponent: Randall Shackelford, Simpson Strong-Tie Co.

Add new text as follows:

R602.10.3.1 Braced Wall Panel Interior Finish Material. Braced wall panels shall have gypsum board installed on the side of the wall opposite the bracing material. Gypsum board shall be not less than 1/2" in thickness and be fastened in accordance with Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.

Exceptions:

1. Wall panels that are braced in accordance with method 5.
2. Wall panels that are braced in accordance with R602.10.6.1.
3. When an approved interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.

Reason: To clarify information in code.

Testimony at the Detroit Final Action Hearings, and background information provided to the IRC Sheathing Ad-Hoc Task Group indicated that sheathing percentages in the IRC are based on gypsum board being installed on the opposite face of braced wall panels. Without this gypsum board installed, the braced wall panel will have insufficient capacity and the minimum percent of braced wall listed in the code will be inadequate, resulting in unsafe residential structures. The addition of this requirement for interior gypsum finish ensures that an important component of braced wall panels will be installed.

The exceptions are to address the following:

1. When gypsum IS the bracing material, it can be either single-sided or double sided.
2. The traditional alternate braced wall panel does not require the additional capacity that gypsum adds.
3. Allowing an alternate material keeps this from being an exclusive specification for one material.

Cost Impact: The code change proposal will increase the cost of construction if interior sheathing is not currently being applied.

Committee Action:

Approved as Modified

Modify proposal as follows:

R602.10.3.1 Braced wall panel interior finish material. Braced wall panels shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than 1/2" in thickness and be fastened in accordance with ~~Table R602.3(1) for sheathing and~~ Table R702.3.5 for interior gypsum wall board.

Exceptions:

1. Wall panels that are braced in accordance with method 5.
2. Wall panels that are braced in accordance with R602.10.6.1.
3. When an approved interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.
4. For methods 2, 3, 4, 6, 7, and 8, gypsum wall board is permitted to be omitted provided the amount of bracing in Table R602.10.1 is multiplied by a factor of 1.5.

Committee Reason: This change clarifies the use of interior gypsum board finish material on the opposite side of the braced wall panels. The modification is based on the ICC Ad Hoc Committee's recommendation and provides for the deletion of the interior gypsum board for several bracing methods where the bracing amount is increased.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Ehrlich, P.E., National Association of Home Builders (NAHB) requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

R602.10.3.1 Braced wall panel interior finish material. Braced wall panels shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than 1/2" in thickness and be fastened in accordance with Table R702.3.5 for interior gypsum wall board.

Exceptions:

1. Wall panels that are braced in accordance with method 5.
2. Wall panels that are braced in accordance with R602.10.6.1.
3. When an approved interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.
4. For methods 2, 3, 4, 6, 7, and 8, gypsum wall board is permitted to be omitted provided the amount of bracing in Table R602.10.1 is multiplied by a factor of ~~4.5~~ 1.3.

Commenter's Reason: The factor of 1.5 is based on the requirement for 6d common sheathing nails per the 2006 IRC. RB169-06/07 increased this required nailing to 8d common nails. Consequently, a factor of 1.3 is appropriate given the increased strength of the braced wall panels using the larger nail size.

Final Action: AS AM AMPC____ D

RB207-06/07

Table R602.10.5, R602.10.5, R602.10.5.1 (New), R602.10.5.2 (New), R602.10.5.3 (New)

Proposed Change as Submitted:

Proponent: Edward L. Keith, APA-The Engineered Wood Association

1. Revise table footnotes as follows:

TABLE R602.10.5

LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN A CONTINUOUSLY SHEATHED WALL ^{a,b,c}
(No change to table entries)

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

- 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.~~

R602.10.5 Continuous wood structural panel sheathing. When continuous wood structural panel sheathing is provided in accordance with Method 3 of Section R602.10.3 on all sheathable areas of all exterior walls, and interior braced wall lines, where required, including areas above and below openings, bracing wall panel lengths shall be in accordance with Table R602.10.5. Wood structural panel sheathing shall be installed at corners in accordance with Figure R602.10.5. ~~The bracing amounts in Table R602.10.1 for Method 3 shall be permitted to be multiplied by a factor of 0.9 for wall with a maximum opening height that does not exceed 85 percent of the wall height or a factor of 0.8 for walls with a maximum opening height that does not exceed 67 percent of the wall height.~~

2. Add new text as follows:

R602.10.5.1 Required bracing. The bracing amounts in Table R602.10.1 for Method 3 shall be permitted to be multiplied by a factor of 0.9 for walls with a maximum opening height that does not exceed 85 percent of the wall height or a factor of 0.8 for walls with a maximum opening height that does not exceed 67 percent of the wall height.

R602.10.5.2 4:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. Full-height sheathed wall segments to on 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. For purposes of calculating the percentage of panel bracing required by Table R602.10.1, the width of the full height sheathing segment shall be equal to its measured width.

R602.10.5.3 6:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. When continuous wood structural panel sheathing is used, full-height sheathed wall segments at openings in garages shall be permitted to have a maximum 6:1 aspect ratio (with height being measured from top of the header to the bottom of the sill plate) providing: Walls on either or both sides of openings shall be built in accordance with Figure R602.10.5(2). Anchorage to the foundation shall be as shown in Figure R602.10.5(2). This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C. For purposes of calculating the percentage of panel bracing required by Table R602.10.1, the width of the full height sheathing segment shall be equal to its measured width.

Reason: To make code easier to use. At present these two important provisions are essentially hidden in the footnotes of Table R602.10.5. This proposal moves them to the text of the code but with minimal changes in content of the existing provisions and no technical content. This is basically an editorial change.

The text starting with the words "The bracing amounts..." in R602.10.5 was moved to new Section R602.10.5.1. The "bracing amount" issue was a departure from the rest of the content in Section R602.10.5.

The proposed change moves the existing provisions in Footnote b of Table R602.10.5 to the proposed R602.10.5.2. The provisions in Footnote b provide for an aspect ratio of 4:1 for certain specific applications, are independent of the content of the table, and better placed in the text of the Code in the section addressing continuous structural panel sheathing.

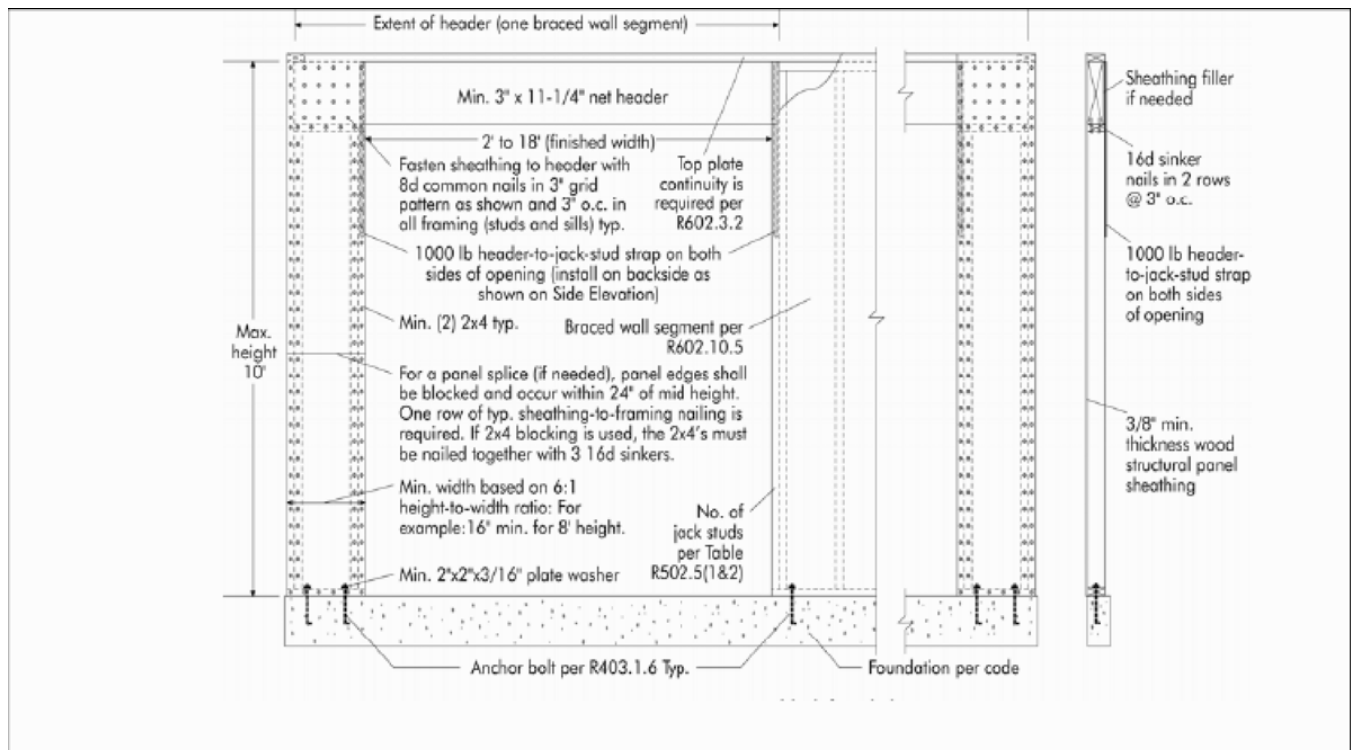
In the proposed R602.10.5.2 a statement has been added clarifying what value to use for the width of the bracing segment when calculating the bracing wall percentage as required by Table R602.10.1. In the case of the proposed R602.10.5.2, it is appropriate to use the actual width of the corner-bracing panel.

This proposal also moves Footnote c of Table R602.10.5 to Section R602.10.5.3. Footnote c permits an aspect ratio of 6:1 if a modified version of the portal frame (Section R602.10.6.2) is used in conjunction with the fully sheathed exterior walls. In addition to moving the language, the proposal adds a figure describing the 6:1 aspect ratio frame used in conjunction with fully sheathed exterior walls. Previously, the footnote referenced a figure and then enumerated exceptions to that figure, making it difficult to use the provisions. Note that the joint must still occur within the middle 24 inches of the vertical leg.

Cost Impact: The code change proposal will not increase the cost of construction.

Errata: Add Item 3 to existing proposal:

3. Add new Figure R602.10.5(2) and renumber Figure R602.10.5 to R602.10.5(1):



**FIGURE R602.10.5(2)
WALLS WITH 6:1 ASPECT RATIO USED WITH CONTINUOUS WOOD STRUCTURAL PANEL SHEATHING**

Committee Action:

Approved as Submitted

Committee Reason: This is a clarifying rearrangement of the provisions and it makes the code easier to follow.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Chuck Bajnai, Chair, ICC Ad Hoc Committee on Wall Bracing, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

R602.10.5.2 4:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. Full-height sheathed wall segments on 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. For purposes of calculating the percentage of panel bracing required by Table R602.10.1(1), the ~~width~~ length of the full height sheathing segment shall be equal to its measured ~~width~~ length.

R602.10.5.3 6:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. When continuous wood structural panel sheathing is used, full-height sheathed wall segments at openings in garages shall be permitted to have a maximum 6:1 aspect ratio (with height being measured from top of the header to the bottom of the sill plate) provided. Walls on either or both sides of openings shall be built in accordance with Figure R602.10.5.2. Anchorage to the foundation shall be as shown in Figure R602.10.5.2. This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C. For purposes of calculating the percentage of panel bracing required by Table R602.10.1(1), the ~~width~~ length of the full height sheathing segment shall be equal to its measured ~~width~~ length.

To coordinate with the figures in Section R602.10, change “width” to “length” in the call-outs to the following figures (figures omitted for clarity):

RB207 As modified - New Figure R602.10.5(2) Walls with 6:1 aspect ratio used with continuous wood structural panel sheathing:

Min. ~~width~~ length based on 6:1 height-to-width ratio: For example: 16” min. for 8’ height

Current Figure R602.10.6.2 Alternate braced wall panel adjacent to a door or window opening:

Min. ~~Width~~ Length = 16” for one story structures

Min. ~~Width~~ Length = 24” for use in the first of two story structures

(Portions of proposal not shown remain unchanged)

Commenter’s Reason: This public comment is essentially editorial. The Ad Hoc Committee on Wall Bracing (AHWB) has noted that the current code uses the terms “width” and “length” somewhat interchangeably, leading to interpretation issues. This public comment, coupled with the approval of RB179 which re-formats the bracing provisions and the AHWB public comments to the figures in RB209 results in uniformity of terminology.

Public Comment 2:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

R602.10.5.2 4:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. ~~Full height sheathed wall segments to on 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. A 4:1 aspect ratio shall be permitted for full-height sheathed wall segments on either side of garage openings that support light frame roofs only, with roof covering dead loads of 3 psf or less.~~ For purposes of calculating the percentage of panel bracing required by Table R602.10.1, the width of the full height sheathing segment shall be equal to its measured width.

R602.10.5.3 6:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. ~~When continuous wood structural panel sheathing is used, full height sheathed wall segments at openings in garages shall be permitted to have a maximum 6:1 aspect ratio (with height being measured from top of the header to the bottom of the sill plate) providing:~~
A maximum 6:1 aspect ratio shall be permitted for full-height sheathed wall segments at openings in garages where all of the following conditions are satisfied.

1. The wall segments are constructed of continuous wood structural panel sheathing.
2. Walls on either or both sides of the garage openings are ~~shall be~~ built in accordance with Figure R602.10.5(2).
3. Anchorage ~~The wall segment is anchored to the foundation shall be~~ as shown in Figure 602.10.5(2).
4. ~~This option shall be permitted for~~ The wall segments are located in the first story of a two-story applications.
5. ~~The building is in~~ Seismic Design Categories A through C.

For purposes of calculating the percentage of panel bracing required by Table R602.10.1, the width of the full height sheathing segment shall be equal to its measured width, and height shall be measured from the top of the header to the bottom of the sill plate.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This is an editorial modification that does not change the meaning of the original proposal. It reformats a long string of provisions into an itemized list that is easier to read and understand, and uses a similar language for the two similar code sections.

Final Action: AS AM AMPC____ D

RB209-06/07

R202, R602.10.5, R602.10.5.1 (New), R602.10.5.2 (New), R602.10.5.3 (New), R602.10.5.4 (New), Table R602.10.5

Proposed Change as Submitted:

Proponent: Ed Sutton, National Association of Home Builders (NAHB)

1. Add new definition as follows:

SECTION R202 GENERAL DEFINITIONS

BRACED WALL LINE, CONTINUOUSLY-SHEATHED. A braced wall line with structural sheathing applied to all sheathable surfaces including the areas above and below openings.

2. Delete and substitute as follows:

~~**R602.10.5 Continuous structural panel sheathing.** When continuous wood structural panel sheathing is provided in accordance with Method 3 of R602.10.3 on all sheathable areas of all exterior walls, and interior braced wall lines, where required, including areas above and below openings, braced wall panel lengths shall be in accordance Table R602.10.5. Wood structural panel sheathing shall be installed at corners in accordance with Figure R602.10.5. The bracing amounts in Table R602.10.1 for Method 3 shall be permitted to be multiplied by a factor of 0.9 for walls with a maximum opening height that does not exceed 85 percent of the wall height, or a factor of 0.8 for walls with a maximum opening height that does not exceed 67 percent of the wall height.~~

R602.10.5 Continuously-sheathed braced wall line using Method 3 (wood structural panel).

3. Add new text as follows:

R602.10.5.1 Continuously-sheathed braced wall line requirements. Continuously-sheathed braced wall line shall comply with all of the following requirements:

1. Structural sheathing shall be applied to all exterior sheathable surfaces of a braced wall line including areas above and below openings.
2. Only full-height braced wall panels shall be used for calculating braced wall amount in accordance with Table R602.10.1.
3. Different bracing methods shall not be permitted within a continuously-sheathed braced wall line.

R602.10.5.2 Braced wall panel length. In a continuously-sheathed wood structural panel braced wall line, the minimum braced wall panel length shall be permitted to be in accordance with Table R602.10.5.

R602.10.5.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously-sheathed braced wall line. A minimum 24-inch wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.5. In lieu of the corner return, a tie-down device with a minimum uplift design value of 800 lb shall be fastened to the corner stud and to the foundation or framing below.

Exception: The first braced wall panel shall be permitted to begin 12 feet from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D₀, D₁, and D₂ provided one of the following is satisfied:

1. A minimum 2-foot wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.5 at the braced wall line ends, or

2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of 800 lb fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below.

R602.10.5.4 Braced wall amount. Braced wall amounts for Method 3 from Table 602.10.1 shall be permitted to be multiplied by a factor of 0.9 for a braced wall line with a maximum opening height that does not exceed 85% of the wall height and by a factor of 0.8 for a braced wall line with a maximum opening height that does not exceed 67% of the wall height.

4. Revise table footnote as follows:

TABLE R602.10.5

LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN A CONTINUOUSLY SHEATHED WALLa, b, c

(No change to table entries)

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

- 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 sides of openings in garages that are part of a continuously-sheathed Method 3 braced wall line 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). Corner returns at the ends of the garage opening wall shall be a minimum of 2-feet in length and shall be in accordance with Figure R602.10.5. This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C.

Reason: The proposed re-write of R602.10.5 is intended to clarify the language related to application of this section. It further deletes the requirement to have all walls of a house to be fully sheathed with wood structural panels. This change makes the requirements consistent with 2000 IRC language and with the technical basis for the IRC bracing provisions. The continuously-sheathed bracing option is intended to provide performance equivalent to a Method 3 braced wall line. IRC does not require Method 3 for all braced wall lines in a house. Therefore, the continuously-sheathed bracing method should not be required for the entire structure.

A definition of continuously-sheathed braced wall line is added to Chapter 2 to provide the code users with a meaning of the term. This term has become very common since its introduction in the 2000 IRC. Adding a definition will facilitate interpretation of the bracing requirements.

Section R602.10.5 is divided into subsections that address specific requirements.

A minimum corner width of 24 inches is included based on the minimum segment width in Table R602.10.5. As the purpose of the corner is to provide overturning restraint, it is allowed to be replaced with a tie-down device. The allowable uplift design value of 800 lb is based on uplift loads measured during testing of shear walls with corners. It is clarified that the first braced wall panel shall be located at the corner or the requirement of the exception should be followed. The exception is consistent with IRC provisions for Method 3 for location of the first braced wall panel. Exception (c) in Table R602.10.5 is modified for consistency with Section 602.10.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Committee Action:

Approved as Modified

Modify proposal as follows:

R602.10.5.1 Continuously-sheathed braced wall line requirements. Continuously-sheathed braced wall line shall be in accordance with Figure R602.10.5(1) and shall comply with all of the following requirements:

1. Structural sheathing shall be applied to all exterior sheathable surfaces of a braced wall line including areas above and below openings.
2. Only full-height braced wall panels shall be used for calculating braced wall amount in accordance with Table R602.10.1.
3. Different bracing methods shall not be permitted within a continuously-sheathed braced wall line. Other approved bracing method shall be permitted on other braced wall lines on the same story level or on different story levels of the building.

R602.10.5.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously-sheathed braced wall line. A minimum 24-inch wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.5. In lieu of the corner return, a tie-down device with a minimum uplift design value of 800 lb shall be fastened to the corner stud and to the foundation or framing below .

Exception: The first braced wall panel shall be permitted to begin 12 feet from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D₀, D₁, and D₂ provided one of the following is satisfied:

1. A minimum 2-foot-long, full-height wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.5 at the braced wall line ends, or

2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of 800 lb fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below.

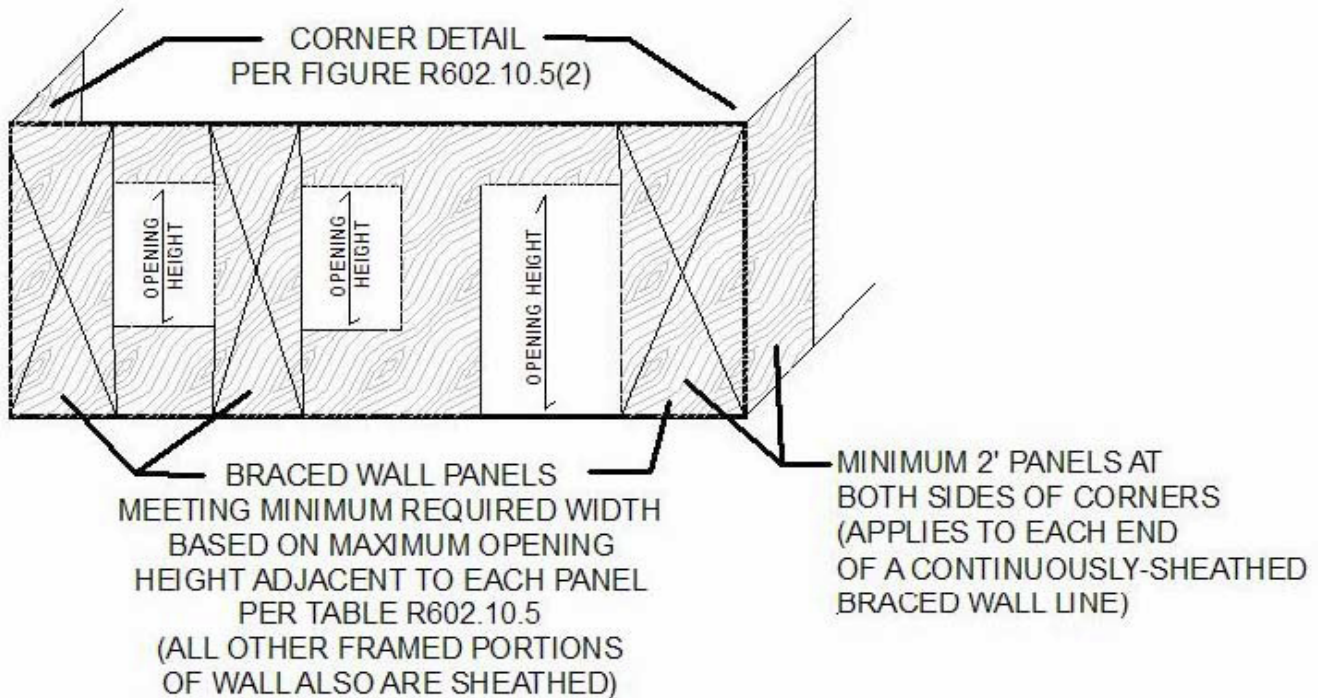
R602.10.5.5 Continuously-sheathed braced wall lines. Where a continuously-sheathed braced wall line is used in Seismic Design Categories D₀, D₁, and D₂ or regions where the basic wind speed exceeds 100 miles per hour, all other exterior braced wall lines in the same story shall be continuously sheathed.

**TABLE R602.10.5
LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN
A CONTINUOUSLY SHEATHED WALL^{a, b, c}**

(No change to table entries)

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

- 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 side of openings in garages that are part of a continuously-sheathed ~~Method 3~~ braced wall line 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). Corner returns at the ends of the garage opening wall shall be a minimum of 2-feet in length and shall be in accordance with Figure R602.10.5. This option shall be permitted for the first story of two-story applications in Seismic Design Categories A through C.



**FIGURE R602.10.5(1)
TYPICAL CONTINUOUSLY-SHEATHED BRACED WALL LINE**

Committee Reason: This change rearranges this section to make it much more understandable to the code user. This is the basis of the understanding reached by the ICC Ad Hoc Committee with respect to the requirement of Section R602.10.5 Continuous Sheathing Method. It clarifies that the continuous sheathing method is not intended to be used throughout the entire structure. This was one of the contentious issues that prompted the creation of the Ad Hoc Committee to study the wall bracing requirements. The modification adds clarification and further defines where the continuous sheathing method must be used in the same story.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Chuck Bajnai, Chair, ICC Ad Hoc Committee on Wall Bracing, requests Approval as Modified.

Further modify proposal as follows:

R602.10.5 Continuously-sheathed braced wall line using Method 3 (wood structural panel). Continuously sheathed braced wall lines using wood structural panels shall comply with this section. Different bracing methods shall not be permitted within a continuously sheathed braced wall line. Other bracing methods prescribed by this code shall be permitted on other braced wall lines on the same story level or on different story levels of the building.

Exception. All exterior braced wall lines shall be continuously sheathed where required by Section R602.10.5.5.

R602.10.5.1 Continuously-sheathed braced wall line requirements. Continuously-sheathed braced wall lines shall be in accordance with Figure R602.10.5(1) and shall comply with all of the following requirements:

1. Structural sheathing shall be applied to all exterior sheathable surfaces of a braced wall line including areas above and below openings.
2. Only full-height braced wall panels shall be used for calculating the braced wall amount-percentage in accordance with Table R602.10.1.
3. ~~Different bracing methods shall not be permitted within a continuously sheathed braced wall line. Other approved bracing method shall be permitted on other braced wall lines on the same story level or on different story levels of the building.~~

R602.10.5.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously-sheathed braced wall line. A minimum 24-inch wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.5. In lieu of the corner return, a tie-down device with a minimum uplift design value of 800 lb shall be fastened to the corner stud and to the foundation or framing below.

Exception: The first braced wall panel shall be permitted to begin 12 feet 6 inches from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D₀, D₁, and D₂ provided one of the following is satisfied:

1. A minimum 2-foot-long, full-height wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.5 at the braced wall line ends, or
2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of 800 lb fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below.

R602.10.5.4 Braced wall amount-percentage. ~~In addition to bracing percentage adjustments specified elsewhere in this code, the braced wall percentages for Method 3 from Table 602.10.1(1) shall be permitted to be multiplied by a factor in accordance with Table R602.10.5.4. Braced wall amounts for Method 3 from Table 602.10.1 shall be permitted to be multiplied by a factor of 0.9 for a braced wall line with a maximum opening clear height that does not exceed 85% of the wall height and by a factor of 0.8 for a braced wall line with a maximum opening clear height that does not exceed 67% of the wall height.~~

**TABLE R602.10.5.4
ADJUSTMENT FACTORS TO THE PERCENTAGE OF REQUIRED BRACING PER WALL LINE-
CONTINUOUSLY SHEATHED**

ADJUSTMENT BASED ON MAXIMUM WALL CLEAR OPENING HEIGHT:		MULTIPLY PERCENTAGE OF BRACING PER WALL LINE BY:
Continuous wood structural panel sheathing when maximum opening height in wall line does not exceed ^a (Section 301.2.2.2.1)	85% of wall height	<u>0.9</u>
	67% of wall height	<u>0.8</u>

a. Percentage of bracing for continuous wood structural panel sheathing shall be based on Method 3 requirements.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: At its December 2006 meeting, the ICC Ad Hoc Wall Bracing Committee (AHWBC) reviewed a draft of the wall bracing requirements that incorporated all the changes approved in Orlando at the Public Hearings. The Committee recommends the above editorial modifications to RB209 for the following reasons:

Section R602.10.5 had a section title only with no text, which is not proper format. The important text from R602.10.5.1, number 3 was moved to the front of this section after the section title. These requirements are more appropriately located at the beginning of the section, since they refer to permitted bracing methods, not braced wall line requirements described in R602.10.5.1. The exception for continuous sheathing in high seismic areas is also recommended to be added to this section to ensure this requirement is noticed by the user.

In R602.10.5.1, number 2, the word "amount" is changed to percentage, for consistency with other sections and other changes made this year. The AHWBC believes that percentage is a better description of how much wall bracing is required on a wall.

The only change to Section R602.10.5.3 is the revision of the length of the first bracing panel from the end from 12 feet to 12 feet 6 inches. This is merely a coordination change with the approved text in Section R602.10.1.2 from RB179.

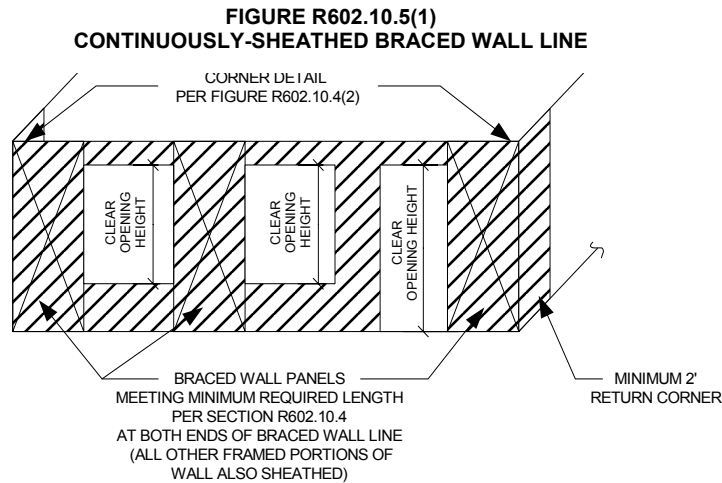
The changes to Section R602.10.5.4 are also coordination changes. This text is coordinated with the approved text from code change RB205 which refers to "other bracing adjustments" and RB207 where Section R602.10.5.1 stipulates the multiplication factors for wall opening height. This text is coordinated with the approved Table R602.10.4(1) from RB 179 which is a tabular form of identifying the wall height adjustment factors.

Public Comment 2:

Chuck Bajnai, Chair, ICC Ad Hoc Committee on Wall Bracing, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

Delete Figure R602.10.5(1) and replace with the new Figure R602.10.5(1) as follows:



(Portions of proposal not shown remain unchanged)

Commenter's Reason: The Ad Hoc Committee on Wall Bracing has further reviewed the figure that was approved as part of the modification and recommends replacement for consistency with the package of bracing provisions. This replacement figure retains the key illustrations of: the entire wall being sheathed; the corner detail being illustrated; and the reference to the applicable section for the bracing requirements. This figure differs from the original figure as follows: clarifies that the opening height is a clear opening height for purposes of the application of provisions; eliminates unnecessary corner detail information as this is covered in the referenced figure; and uses the revised terminology of bracing "length" versus "width".

Public Comment 3:

Chuck Bajnai, Chair, ICC Ad Hoc Committee on Wall Bracing, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

R602.10.5.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously-sheathed braced wall line. A minimum 24-inch wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.4.3 In lieu of the corner return, a tie-down device with a minimum uplift design value of 800 lb shall be fastened to the corner stud and to the foundation or framing below in accordance with Figure R602.10.5.3 (1).

Exception: The first braced wall panel shall be permitted to begin 12 feet from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D₀, D₁, and D₂ provided one of the following is satisfied:

1. A minimum 2-foot-long, full-height wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.5 at the braced wall line ends in accordance with Figure R602.10.5.3(2), or
2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of 800 lb fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below in accordance with Figure R602.10.5.3 (3).

Add new figures as shown:

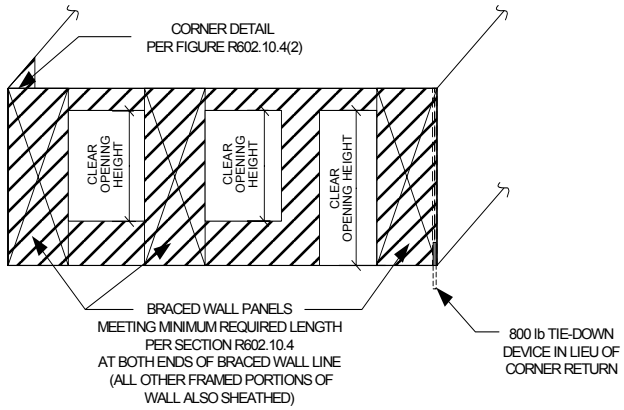


FIGURE R602.10.5(1)
CONTINUOUSLY-SHEATHED BRACED WALL LINE-WITHOUT CORNER RETURN

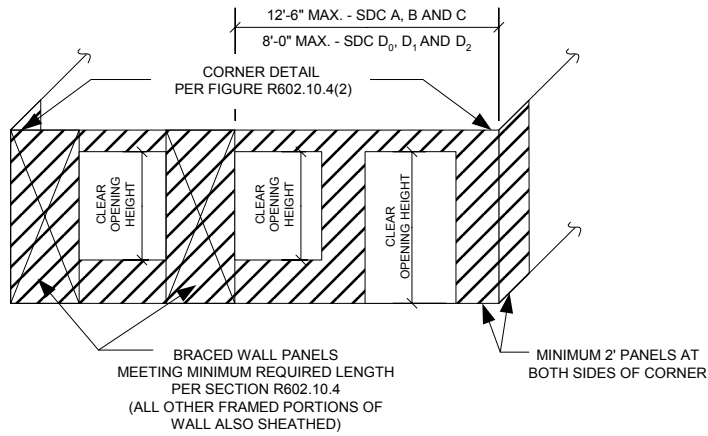


FIGURE R602.10.5.3(2)
CONTINUOUSLY SHEATHED BRACED WALL LINE-FIRST BRACED WALL PANEL AWAY FROM END OF WALL LINE WITHOUT TIE DOWN

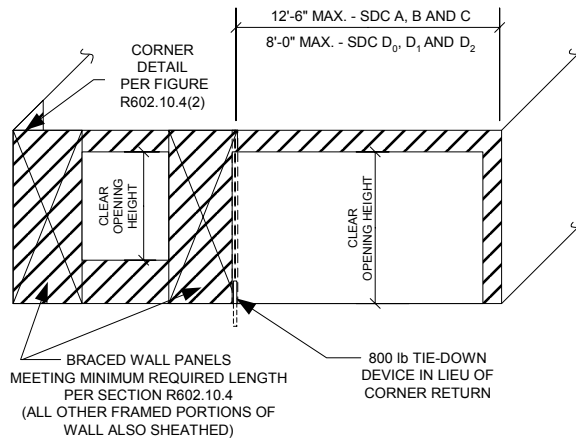


FIGURE R602.10.5.3(3)
CONTINUOUSLY SHEATHED BRACED WALL LINE – FIRST BRACED
WALL PANEL AWAY FROM END OF WALL LINE WITH TIE DOWN

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The proposed public comment adds 3 new figures to help the code user understand the intent of the continuous sheathing requirements. Given the recent history of issues with interpretation of this section of the IRC, the ICC Ad Hoc Committee on Wall Bracing believes that figures are needed to complement the text with simple visual examples. The figures are developed to show continuous braced wall lines with various options for anchoring the first braced wall panel. Furthermore, the style of the proposed figures is consistent with the graphics in RB179 -- a complete reformat of the wall bracing provisions. The proposed modification does not change any requirements previously approved by the IRC Code Development Committee at the hearings in Orlando in September 2006.

Public Comment 4:

Randall Shackelford, P.E., Simpson Strong-Tie Co., requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

R602.10.5.4 Braced wall amount. Braced wall amounts for Method 3 from Table 602.10.1 shall be permitted to be multiplied by a factor of 0.9 for a braced wall line with a maximum opening height that does not exceed 85% of the wall height and by a factor of 0.8 for a braced wall line with a maximum opening height that does not exceed 67% of the wall height.

Exception: Reductions in braced wall amounts shall not be applied when braced walls are made up of panels constructed in accordance with Footnotes b and c of Table R602.10.5 that have an aspect ratio less than 3½:1.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The allowable reductions in braced wall amounts of Section R602.10.5.4 are based on the use of the perforated shearwall method to determine the allowable shear of the braced wall panel. The smaller the size of the wall opening in the wall, the higher shear capacity of the braced wall panel will be, allowing a reduction in amount of bracing.

However, the perforated shearwall method only applies when the individual full height shear wall segments have an aspect ratio no greater than 3½:1. Wall segments constructed in accordance with Footnotes b and c of Table R602.10.5 have an aspect ratio of 6:1, far too narrow to be considered effective in the perforated shearwall method. Refer to Section 2305.3.8.2 of the International Building Code. In addition, braced wall panels constructed in accordance with Footnotes b and c of Table R602.10.5 are not really shearwalls at all, they are considered portal frame systems. Therefore any reductions that are derived from the perforated shearwall system is not applicable.

Public Comment 5:

Randall Shackelford, P.E., Simpson Strong-tie Co., requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

R602.10.5.1 Continuously-sheathed braced wall line requirements. Continuously-sheathed braced wall line shall be in accordance with Figure R602.10.5(1) and shall comply with all of the following requirements:

1. Structural sheathing shall be applied to all exterior sheathable surfaces of a braced wall line including areas above and below openings.
2. Only full-height braced wall panels shall be used for calculating braced wall amount in accordance with Table R602.10.1.
3. Different bracing methods shall not be permitted within a continuously-sheathed braced wall line. Other approved bracing method shall be permitted on other braced wall lines on the same story level or on different story levels of the building.
4. One or more braced wall panels having a total length of 48 inches shall be located within 16.5 feet of the end of each braced wall line, and located a maximum of 25 feet on center along each braced wall line. The 48 inches of bracing shall be made up of panels whose lengths comply with the minimum lengths of Table R602.10.5

Exceptions:

1. Alternate braced wall panels constructed in accordance with R602.10.2 shall be considered to be equal to 48 inches of sheathing.
2. Braced wall panels located at either side of a garage that are constructed in accordance with Footnotes b and c of Table R602.10.5 shall be permitted to have a length of less than 48 inches.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This change is necessary to keep the performance of braced wall lines constructed of continuously sheathed method equivalent to standard bracing methods.

Standard bracing methods, that have been used for years, require a 48 inch long braced wall panel at the end of a braced wall line and 25 feet on center along that line. Recently an exception was added to allow the braced wall panel to start within 12.5 feet from the end of a braced wall line.

The bracing amounts and construction methods of the IRC were designed and calibrated to provide equivalent performance to this traditional bracing method.

The IRC has been silent on spacing and placement of braced wall panels constructed using the continuous sheathing method. This can result in braced wall panels not being evenly spaced along the braced wall line, affecting performance.

Since braced wall panels can have widths less than 48 inches in the continuously sheathed method, it is proposed to simply require that a minimum length of 48" of sheathing be provided in the same locations as would be required using any other bracing method. The permitted 12.5 feet from the end was added to the 4 feet length of the braced wall panel, to get 16.5 feet.

Public Comment 6:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

R602.10.5.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously sheathed braced wall line. A minimum 24-inch wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.5. In lieu of the corner return, a tie-down device with a minimum uplift design value of ~~800~~ **1800** lb shall be fastened to the corner stud and to the foundation or framing below.

Exception: The first braced wall panel shall be permitted to begin 12 feet from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D0, D1, and D2 provided one of the following is satisfied:

1. A minimum 2-foot-long, full-height wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.5 at the braced wall line ends, or
2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of ~~800~~ **1800** lb fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal increases the minimum uplift design value to 1800 pounds to be consistent with Table R602.10.6.

Final Action: AS AM AMPC____ D