

# **TOWN OF ELLINGTON**

**Building Department**

**57 Main Street**

**Ellington, CT 06029**

**(860) 870-3124**

## **A GUIDE TO Braced Wall Lines BASED ON THE 2009 IRC**

(Commonly referred to as Wind Bracing. This guide is based on the 100 mph Wind Zone which applies in Ellington, CT)

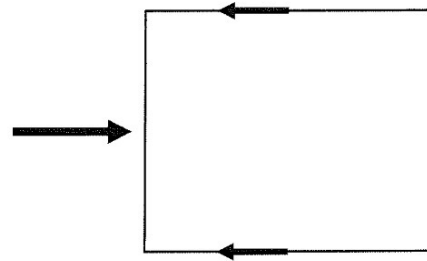
As of February 28, 2014, the State of Ct adopted the 2009 International Residential Code (IRC). In the 2009 IRC, the design wind speed for most of interior CT was changed to 100mph, and as a result the location, design, and construction requirements of exterior braced walls and interior braced walls are more in-depth and more complicated. This handout will concentrate on some of the bracing methods listed in those requirements. The goal is to help the designer provide the code official with the proper information for a plan review. The information provided are excerpts from Chapter 6 of the 2009 IRC and are used as an informational reference only. Please refer to the official 2009 IRC codebook for more detailed information regarding the requirements. I would also like to make aware of two instances that are not covered by the prescriptive code requirements. They are structures with pier foundations and those that contain two story open walls over 21' wide. These two conditions are not addressed by the code and will require engineering.

With the adoption of the 2009 IRC, it is now required that any IRC structure submit a "Braced Wall Line" plan, identifying the location of each braced wall line and the bracing method to be used. This should include the minimum amount of bracing required per Table R602.10.1.2(1), and the amount of bracing provided. There also needs to be a table shown that lists the braced wall line number, method of bracing, braced wall line spacing, exposure category factor, roof eave to ridge height factor, wall height factor, # of braced wall lines factor, calculated required bracing length, and total provided length of bracing. This information will allow the building official to perform a proper plan review and also aid the building inspection process. Any changes to the layout of the building (floor plan, window/door locations, etc) after the plans have been reviewed will require updated bracing calculations. Having all of the information on the plans on site will aid the builder, designer, and inspector and will result in less confusion and delays. It is the responsibility of the designer to identify bracing locations and perform these calculations. There is a lot of new information here and I encourage you to call with any questions you may have. I also suggest scheduling an appointment to go over your design prior to submittal. This will ensure that you understand what is required and will result in a smoother permit process.

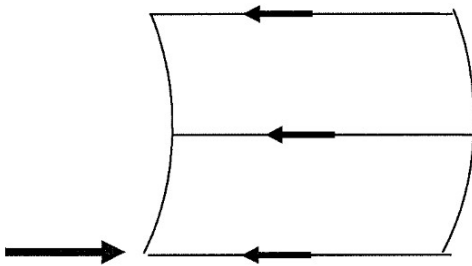
## The Issue:

When the wind blows against a structure, there must be enough strength built into the walls to resist that force.

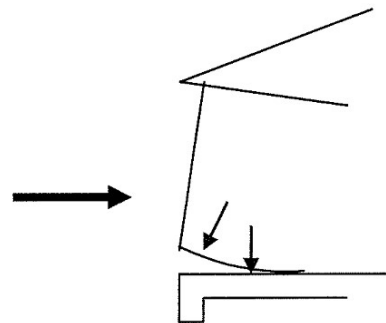
Otherwise, the building will slide, lean, or fall over.



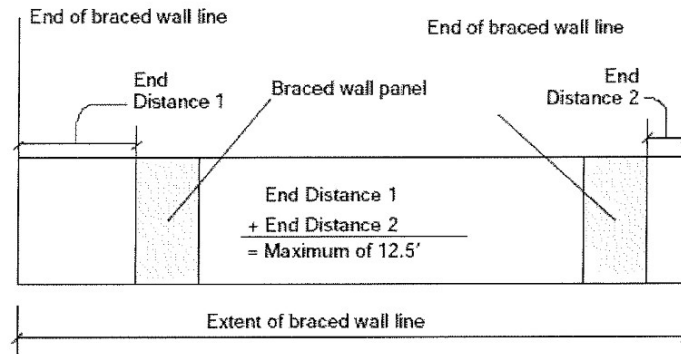
When the exterior walls are too far apart, the interior walls of the building must also be designed to resist the forces of the wind. If not, the structure has a tendency to bow in the middle. Thus, interior braced wall lines may need to be identified. When using interior braced wall lines, the required bracing length must be increased. See Table R602.10.1.2(1), footnote e.



When the wind blows against the structure, if it cannot push the building off of the slab, it will try and lift the building up and roll it over. Thus, it is important to hold down the outside edges of the walls.



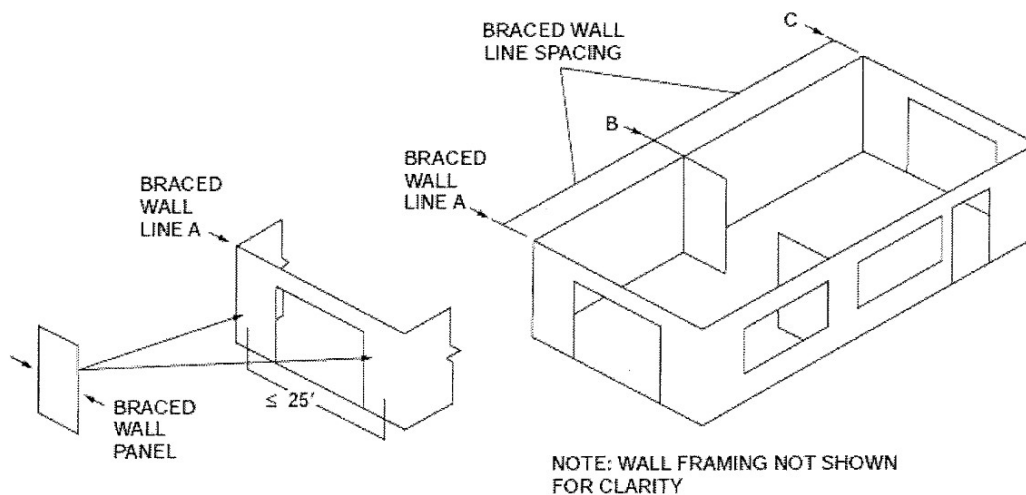
Since the wind is going to try and pick up the outside edge, it is important that the braced wall panels be close to this location. IRC Section R602.10.1.4 and Figure R602.10.1.4(2) clarify that the distance from the outside walls to the edge of the first braced wall panel, **when added together**, cannot exceed 12.5'. This will allow some doors/windows to be at the exterior edge of the braced wall line. And, braced wall panels cannot be more than 25' on center (21' between panel edges) apart along the entire wall length. See figure 602.10.1.4(1).



Braced wall panel shall be permitted to be located away from the end of a braced wall line, provided the total end distance from each end to the nearest braced wall panel does not exceed 12.5'. If braced wall panel is located at the end of the braced wall line, then end distance is 0'.

For SI: 1 foot = 304.8 mm.

FIGURE R602.10.1.4(2)  
BRACED WALL PANEL END DISTANCE REQUIREMENTS (SDC A, B AND C)

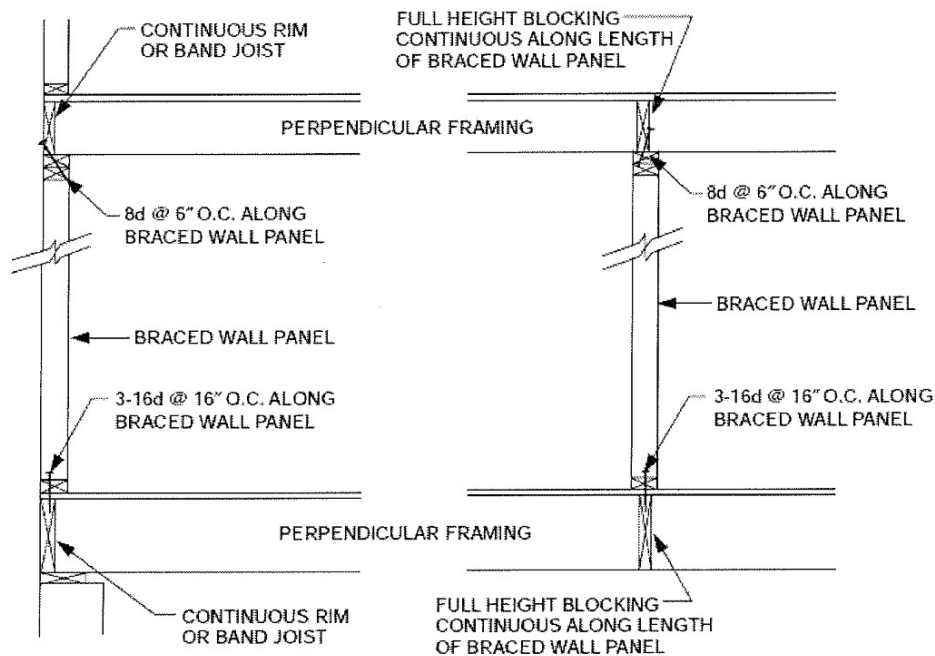


For SI: 1 foot = 304.8 mm.

FIGURE R602.10.1.4(1)  
BRACED WALL PANELS AND BRACED WALL LINES

## Connection to Framing Members

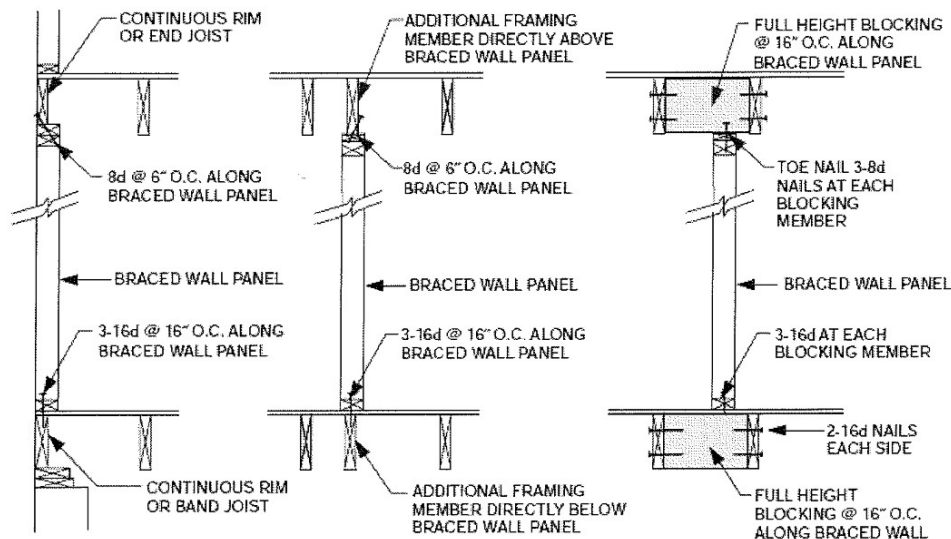
In order to connect the structure together so that the wind load is distributed throughout the building, there are requirements on how to tie a braced wall panel to floor framing/ceiling framing that is perpendicular or parallel to the wall as shown in Figures R602.10.6(1) and R602.10.6(2) below:



For SI: 1 inch = 25.4 mm.

FIGURE R602.10.6(1)  
BRACED WALL PANEL CONNECTION WHEN PERPENDICULAR TO FLOOR/CEILING FRAMING



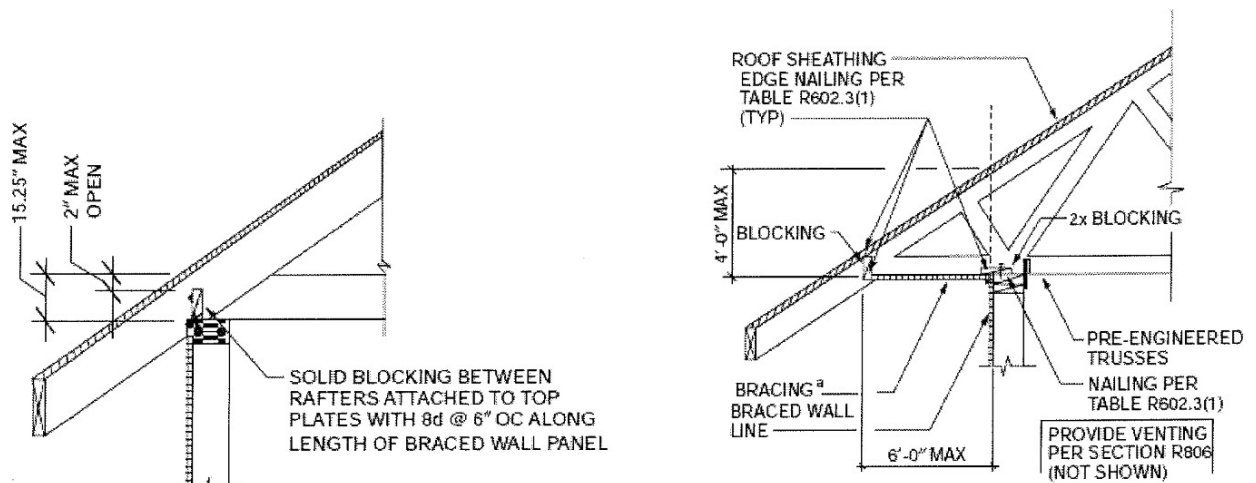


For SI: 1 inch = 25.4 mm.

FIGURE R602.10.6(2)  
BRACED WALL PANEL CONNECTION WHEN PARALLEL TO FLOOR/CEILING FRAMING

In order to keep the roof framing from laying over flat at the location of the exterior braced wall panels, bracing must extend up between the joists and/or trusses, per Section R602.10.6.2, as follows:

- Standard lateral bracing always applies throughout the structure for rafters and ceiling joists, Section R802.8.1, and for trusses, Section R802.10.3.
- Lateral bracing at the location of the exterior wind bracing panels shall be based on the distance from the top plate to the roof deck as follows:
  - When up to 15.25", see Figure R602.10.6.2(1) for rafters and see Section R802.10.3 for trusses.
  - When more than 15.25" but not exceeding 4' maximum, see Figure R602.10.6.2(2) and Figure R602.10.6.2(3).
- Other than the normal bracing required by Section R802.8.1 and R802.10.3, bracing for braced wall lines is only required at each panel location. Not the entire wall length.



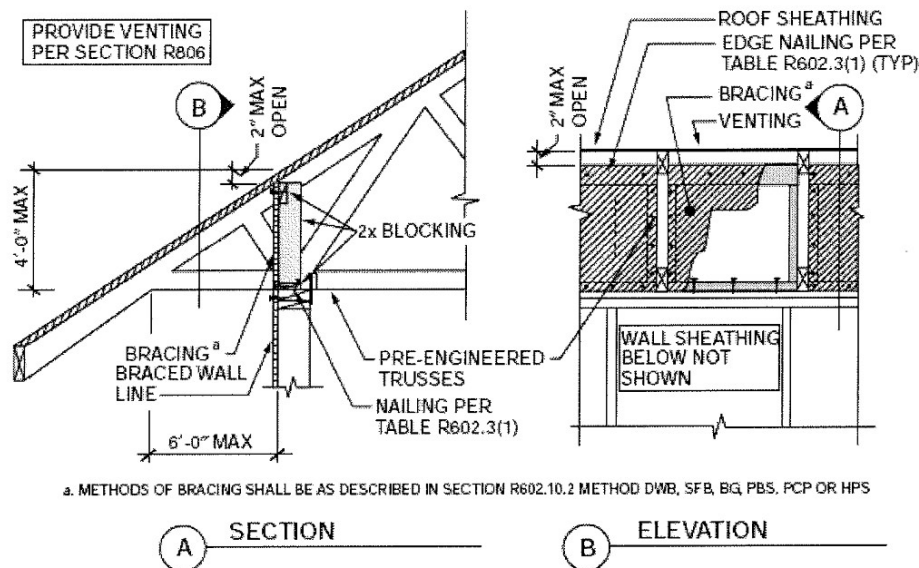
a. METHODS OF BRACING SHALL BE AS DESCRIBED IN SECTION R602.10.2 METHOD DWB, WSP, SFB, GB, PBS, PCP OR HPS

For SI: 1 inch = 25.4 mm.

**FIGURE R602.10.6.2(1)**  
**BRACED WALL PANEL CONNECTION**  
**TO PERPENDICULAR RAFTERS**

For SI: 1 inch = 25.4 mm.

**FIGURE R602.10.6.2(2)**  
**BRACED WALL PANEL CONNECTION OPTION TO**  
**PERPENDICULAR RAFTERS OR ROOF TRUSSES**



**FIGURE R602.10.6.2(3)**  
**BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES**

**TABLE R602.3(3) REQUIREMENTS FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES<sup>a,b,c</sup>**

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNES S (inches)	MAXIMUM WALL STUD SPACING (inches)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (mph)		
Size	Penetration (inches)				Edges (inches o.c.)	Field (inches o.c.)	Wind exposure category		
							B	C	D
6d Common(2.0" × 0.113")	1.5	24/0	3/8	16	6	12	110	90	85
8d Common(2.5" × 0.131")	1.75	24/16	7/16	16	6	12	130	110	105
				24	6	12	110	90	85

For SI: 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s.

- ☐ Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
- ☐ Table is based on wind pressures acting toward and away from building surfaces per **Section R301.2**. Lateral bracing requirements shall be in accordance **with Section R602.10**.
- ☐ Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

# Identification of the braced wall line location And Plan Requirements:

Definitions:

**IRC Section R202**

**Braced Wall Line.** A straight line through the building plan that represents the location of the lateral resistance provided by the wall bracing.

**Braced Wall Line, Continuously Sheathed.** A *braced wall line* with structural sheathing applied to all sheathable surfaces including the areas above and below openings.

**Braced Wall Panel.** A full-height section of wall constructed to resist in-plane shear loads through interaction of framing members, sheathing material and anchors. The panel's length meets the requirements of its particular bracing method, and contributes toward the total amount of bracing required along its braced wall line in accordance with Section R602.10.1.

**R602.10.1 Braced wall lines.** The end of a braced wall line shall be considered to be either:

- The intersection with perpendicular exterior walls or projection thereof, or;
- The intersection with perpendicular braced wall lines.

BWL- Braced Wall Line

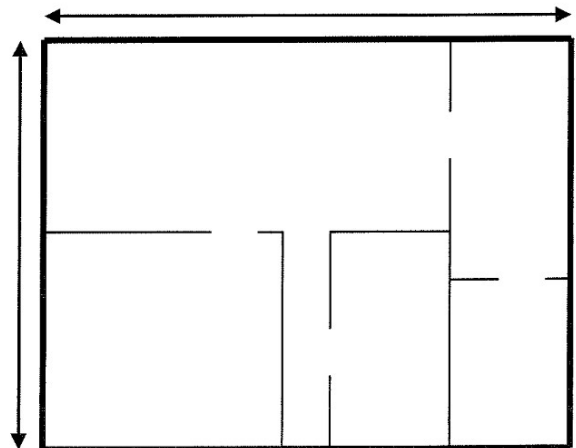
BWP- Braced Wall Panel

H/D- Hold Down Device

All exterior walls are braced wall lines.  
If no other walls are chosen, then the following provisions apply.

The maximum distance allowed is 60' separation. That is the limit for Table R602.10.1.2(1). However, with that separation, each braced wall panel is required to have a higher construction requirement. See Figure R602.10.1.4(1).

Therefore, most tract homes, if  $\leq 60'$  x  $60'$ , can be designed using exterior walls only. This may limit the amount and location of exterior doors and windows, but would avoid interior braced wall lines.



The building plans must include the location, method used, amount of bracing required, amount of bracing provided and the location of each BWP on each Braced Wall Line.

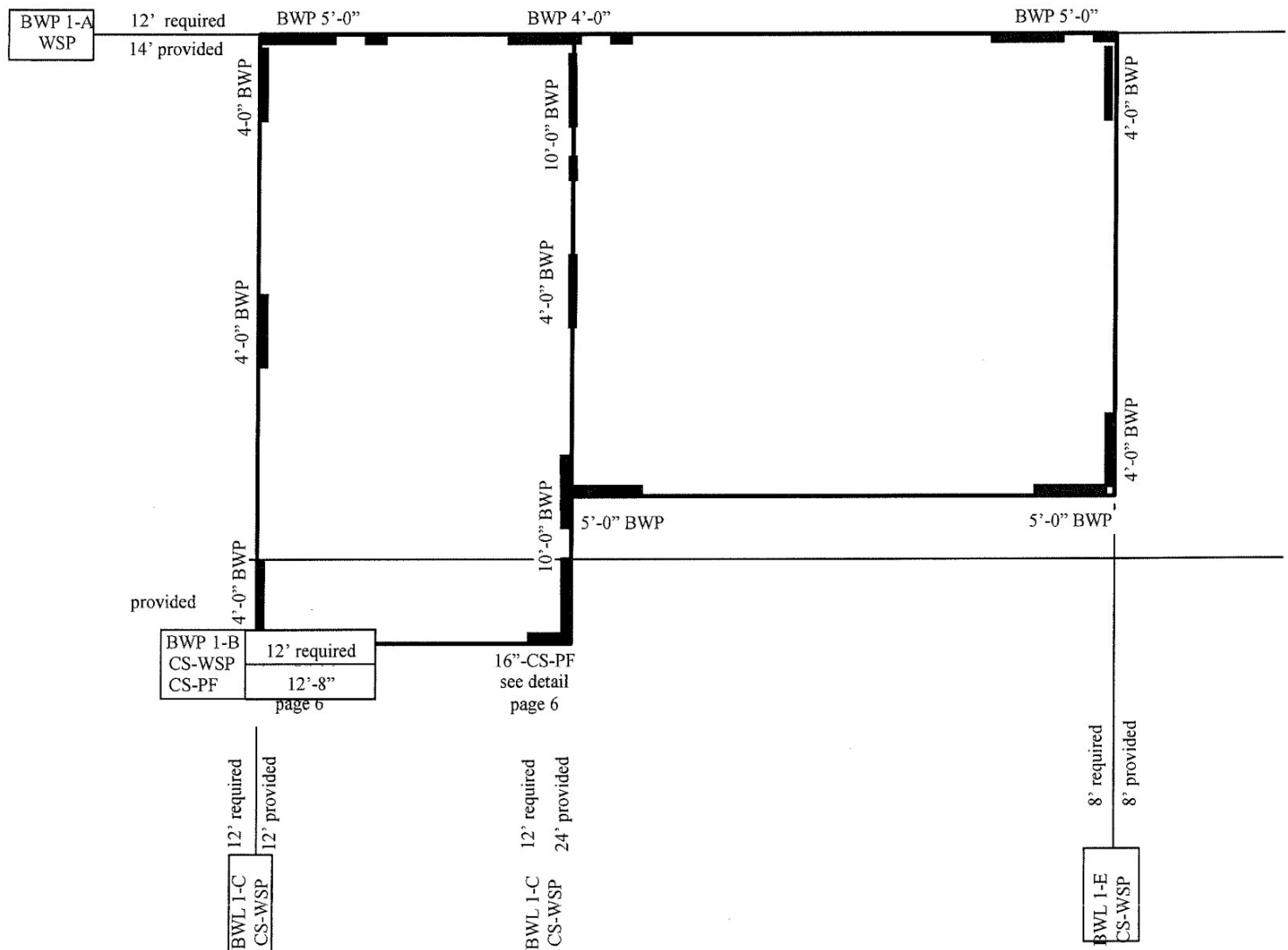
The Braced Wall Line Plan shall also contain the following:

- A duplicate copy of all floor plans, with a highlight or overshadow marking each of the braced wall lines or marking the actual location of the braced wall panels in the new construction area.

A worksheet must be included indicating the starting BWP amount and the required BWP amount after all applicable adjustment factors have been considered.

EXAMPLE OF PLAN REQUIREMENTS:

Braced line #	Bracing Method	Wall line spacing	Exposure category factor	Roof Eave to ridge height factor	Wall height factor	# of braced wall lines factor	Required bracing	Provided bracing



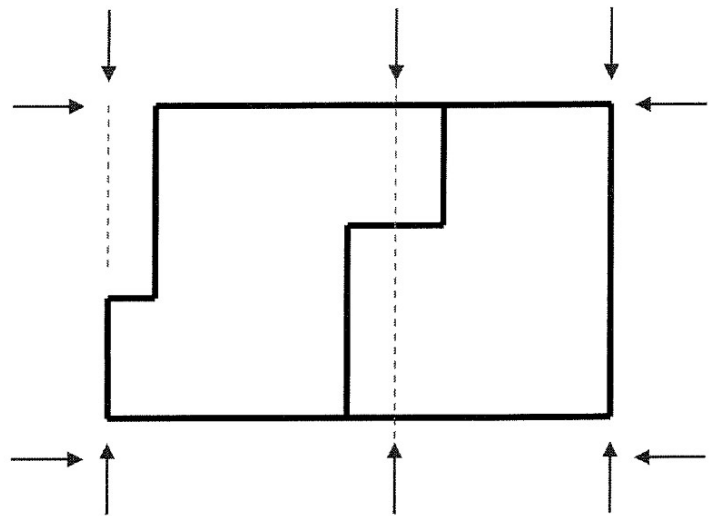
## Offsets:

The braced wall line does not have to be a continuous wall. Off sets are permitted.

**R602.10.1.4 Braced wall panel location.** *Braced wall panels* may be offset out-of-plane up to 4 feet from the designated *braced wall line* provided that the total out-to-out- offset of *braced wall panels* in a *braced wall line* is not more than 8 feet in accordance with figures R602.10.1.4(3) and R602.10.1.4(4). All *braced wall panels* within a *braced wall line* shall be permitted to be offset from the designated *braced wall line*.

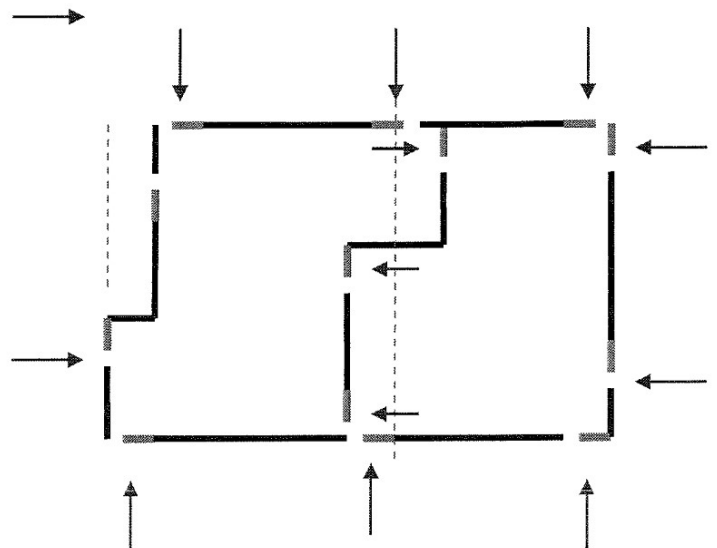
Example: Dashed arrows indicate location of braced wall lines. Interior braced wall lines must terminate at an exterior or interior braced wall line.

Off-sets cannot be any more than 4' of either side of the identified braced wall line with a total of 8' separation. Notice that none of the walls have to actually be in the location of the identified braced wall line.



## Maximum distance between BWP's

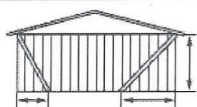
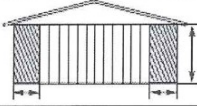
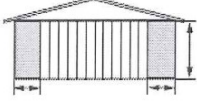
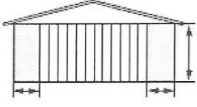

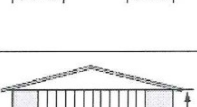
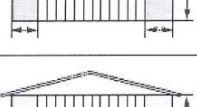
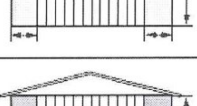
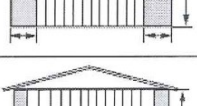
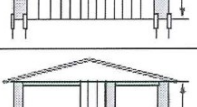
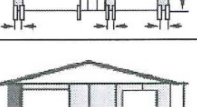
Braced wall panels must be no further apart than 25' o.c.(21' between edges)  
Notice the possible locations permitted (shown as dashed lines), keeping in mind that the distance from the ends of a particular wall, when added together (except CS methods), cannot exceed 12.5'.



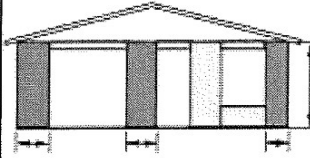
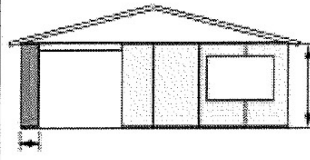
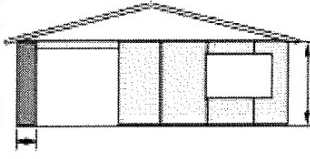
# Braced Wall Panel construction methods:

The design options listed in Table R602.10.2 are available for use.

TABLE R602.10.2  
INTERMITTENT BRACING METHODS

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
LIE	Let-in-bracing	1 × 4 wood or approved metal straps at 45° to 60° angles for maximum 16" stud spacing		Wood: 2-8d nails per stud including top and bottom plate metal: per manufacturer
DWB	Diagonal wood boards	$\frac{3}{4}$ " (1" nominal) for maximum 24" stud spacing		2-8d ( $2\frac{1}{2}$ " × 0.113") nails or 2 staples, $1\frac{3}{4}$ " per stud
WSP	Wood structural panel (see Section R604)	$\frac{3}{8}$ "		For exterior sheathing see Table R602.3(3) For interior sheathing see Table R602.3(1)
SFB	Structural fiberboard sheathing	$\frac{1}{2}$ " or $\frac{25}{32}$ " for maximum 16" stud spacing		$1\frac{1}{2}$ " galvanized roofing nails or 8d common ( $2\frac{1}{2}$ " × 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports)
GB	Gypsum board	$\frac{1}{2}$ "		Nails or screws at 7" spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5
PBS	Particleboard sheathing (see Section R605)	$\frac{3}{8}$ " or $\frac{1}{2}$ " for maximum 16" stud spacing		$1\frac{1}{2}$ " galvanized roofing nails or 8d common ( $2\frac{1}{2}$ " × 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports)
PCP	Portland cement plaster	See Section R703.6 For maximum 16" stud spacing		$1\frac{1}{2}$ ", 11 gage, $\frac{7}{16}$ " head nails at 6" spacing or $\frac{7}{8}$ ", 16 gage staples at 6" spacing
HPS	Hardboard panel siding	$\frac{7}{16}$ " For maximum 16" stud spacing		0.092" dia., 0.225" head nails with length to accommodate $1\frac{1}{2}$ " penetration into studs at 4" spacing (panel edges), at 8" spacing (intermediate supports)
ABW	Alternate braced wall	See Section R602.10.3.2		See Section R602.10.3.2
PFH	Intermittent portal frame	See Section R602.10.3.3		See Section R602.10.3.3
PFG	Intermittent portal frame at garage	See Section R602.10.3.4		See Section R602.10.3.4

**TABLE R602.10.4.1 CONTINUOUS SHEATHING METHODS**

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
CS-WSP	Wood structural panel	$\frac{3}{8}$ "		6d common (2" x 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) or 16 ga. x 1 3/4" staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)
CS-G	Wood structural panel adjacent to garage openings and supporting roof load only <sup>a,b</sup>	$\frac{3}{8}$ "		See Method CS-WSP
CS-PF	Continuous portal frame	See Section R602.10.4.1.1		See Section R602.10.4.1.1

## Braced Wall Panel construction requirements:

Braced Wall Panels shall be full height, from bottom plate to top plate. **Any portion that is notched around windows or doors does not count as part of the panel.**

**R602.10.2.1 Intermittent braced wall panel interior finish material.** Intermittent *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 inch in thickness and be fastened in accordance with Table R702.3.5 for interior gypsum wall board. (Intermittent does not include the CS methods)

### Exceptions:

- ☐ Wall panels that are braced in accordance with Methods GB, ABW, PFG and PFH.
- ☐ When an approved interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.
- 3. For Methods DWB, WSP, SFB, PBS, PCP and HPS, omitting gypsum wall board is permitted provided the length of bracing in Tables R602.10.1.2(1) and R602.10.1.2(2) is multiplied by a factor of 1.5 {NOTE: Table 602.10.1.2(1) footnote "f" requires a 1.4 factor, either can be used}.

**R602.10.3 Minimum length of braced panels.** For Methods DWB, WSP, SFB, PBS, PCP and HPS, each *braced wall panel* shall be at least 48 inches in length, covering a minimum of three stud spaces where studs are spaced 16 inches on center and covering a minimum of two stud spaces where studs are spaced 24 inches on center. For Method GB, each *braced wall panel* shall be at least 96 inches in length where applied to one face of a *braced wall panel* and at least 48 inches where applied to both



faces. For Methods DWB, WSP, SFB, PBS, PCP and HPS, for purposes of computing the length of panel bracing required in Tables R602.10.1.2(1) and R602.10.1.2(2), the effective length of the *braced wall panel* shall be equal to the actual length of the panel. When Method GB panels are applied to only one face of a *braced wall panel*, bracing lengths required in Tables R602.10.1.2(1) and R602.10.1.2(2) **for Method GB shall be doubled.**

**Exceptions:**

- Lengths of *braced wall panels* for continuous sheathing methods shall be in accordance with Table R602.10.4.2.
- Lengths of Method ABW panels shall be in accordance with Section R602.10.3.2.
- Length of Methods PFH and PFG panels shall be in accordance with Section R602.10.3.3 and R602.10.3.4 respectively.
- For Methods DWB, WSP, SFB, PBS, PCP and HPS in Seismic Design Categories A, B, and C: Panels between 36 inches and 48 inches in length shall be permitted to count towards the required length of bracing in Tables R602.10.1.2(1) and R602.10.1.2(2), and the effective contribution shall comply with Table R602.10.3.

**R602.10.3.1 Adjustment of length of braced panels.** When *story height* (H), measured in feet, exceeds 10 feet, in accordance with Section R301.3, the minimum length of *braced wall panels* specified in Section R02.10.3 shall be increased by a factor H/10. See Table R602.10.3.1. Interpolation is permitted.

## Total Required Length (width) of all Panels in one Braced Wall Line


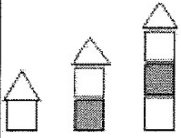
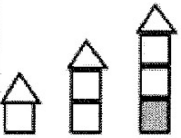
Table R602.10.1.2(1) provides the necessary length that is required, adding all of the widths of each wind bracing panel along a single wall. With a minimum of 4' panel width at 25' o.c., it is possible that this accumulated individual panel width provides more width than required by the table. If 4' of panel width at 25' o.c. does not meet the minimum requirement, extra panel width will need to be added to meet the minimum.

Ellington, CT is in the 100 mph basic wind speed.

Take note that the table is limited to the following:

- **Exposure Category B.** (See Section R301.2.1.4 for definition of exposure category. Most homes, unless alone and on a hill top, will qualify for Category B.) For a different exposure height, see the table for footnote b.
- **30' maximum mean roof height.** For higher mean roof height, see the table for footnote b.
- **10' maximum eave to ridge height.** For higher dimensions, see footnote c.
- **10' maximum wall height.** For higher wall height, see adjustments necessary under Table R602.10.3.1.
- **2 braced wall lines.** If more braced wall lines are installed, the minimum required length of bracing is increased per footnote e.
- **Gypsum wall board,** per Section R602.10.2.1, is required on the inside of wall bracing. If not installed on the inside, see footnote f.

**TABLE R602.10.1.2(1)<sup>a, b, c, d, e</sup> BRACING REQUIREMENTS BASED ON WIND SPEED (as a function of braced wall line spacing)**

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 10 FT WALL HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB <sup>f, h</sup>	Method GB (double sided) <sup>g</sup>	Methods DWB, WSP, SFB, PCP, HPS <sup>f, i</sup>	Continuous Sheathing
≤ 100 (mph)		10	4.5	4.5	2.5	2.5
		20	8.5	8.5	5.0	4.0
		30	12.0	12.0	7.0	6.0
		40	15.5	15.5	9.0	7.5
		50	19.0	19.0	11.0	9.5
		60	22.5	22.5	13.0	11.0
		10	8.5	8.5	5.0	4.5
		20	16.0	16.0	9.0	8.0
		30	23.0	23.0	13.0	11.0
		40	29.5	29.5	17.0	14.5
		50	36.5	36.5	21.0	18.0
		60	43.5	43.5	25.0	21.0
		10	NP	12.5	7.5	6.0
		20	NP	23.5	13.5	11.5
		30	NP	34.0	19.5	16.5
		40	NP	44.0	25	21.5
		50	NP	54.0	31	26.5
		60	NP	64.0	36.5	31.0

**Important Note:** When using Structural fiberboard sheathing (SFB) it is important to read the manufacturer's installation instructions, particularly for items such as stud spacing, nailing requirements and penetrations. Some fiberboard sheathing is not allowed to have any penetrations (no holes) in the section that is used for bracing.

**TABLE R602.10.1.2(1)<sup>a, b, c, d, e</sup>—continued**  
**BRACING REQUIREMENTS BASED ON WIND SPEED**  
**(as a function of braced wall line spacing)**

For SI: 1 foot = 304.8 mm, 1 inch = 25.4 mm, 1 mile per hour = 0.447 m/s, 1 pound force = 4.448 N.

a. Tabulated bracing lengths are based on Wind Exposure Category B, a 30-ft mean roof height, a 10-ft eave to ridge height, a 10-ft wall height, and two braced wall lines sharing load in a given plan direction on a given story level. Methods of bracing shall be as described in Sections R602.10.2, R602.10.4 and R602.10.5. Interpolation shall be permitted.

NUMBER OF STORIES	EXPOSURE/HEIGHT FACTORS		
	Exposure B	Exposure C	Exposure D
1	1.0	1.2	1.5
2	1.0	1.3	1.6
3	1.0	1.4	1.7

b. For other mean roof heights and exposure categories, the required bracing length shall be multiplied by the appropriate factor from the following table:

c. For other roof-to-eave ridge heights, the required bracing length shall be multiplied by the appropriate factor from the following table; interpolation shall be permitted.

SUPPORT CONDITION	ROOF EAVE-TO-RIDGE HEIGHT			
	5 ft or less	10 ft	15 ft	20 ft
Roof only	0.7	1.0	1.3	1.6
Roof + floor	0.85	1.0	1.15	1.3
Roof + 2 floors	0.9	1.0	1.1	NP

d. For a maximum 9-foot wall height, multiplying the table values by 0.95 shall be permitted. For a maximum 8-foot wall height, multiplying the table values by 0.90 shall be permitted. For a maximum 12-foot wall height, the table values shall be multiplied by 1.1.

e. For three or more braced wall lines in a given plan direction, the required bracing length on each braced wall line shall be multiplied by the appropriate factor from the following table:

NUMBER OF BRACED WALL LINES	ADJUSTMENT FACTOR
3	1.30
4	1.45
≥ 5	1.60

f. Bracing lengths are based on the application of gypsum board finish (or equivalent) applied to the inside face of a braced wall panel. When gypsum board finish (or equivalent) is not applied to the inside face of braced wall panels, the tabulated lengths shall be multiplied by the appropriate factor from the following table:

BRACING METHOD	ADJUSTMENT FACTOR
Method LIB	1.8
Methods DWB, WSP, SFB, PBS, PCP, HPS	1.4

g. Bracing lengths for Method GB are based on the application of gypsum board on both faces of a braced wall panel. When Method GB is provided on only one side of the wall, the required bracing amounts shall be doubled. When Method GB braced wall panels installed in accordance with Section R602.10.2 are fastened at 4 inches on center at panel edges, including top and bottom plates, and are blocked at all horizontal joints, multiplying the required bracing percentage for wind loading by 0.7 shall be permitted.

h. Method LIB bracing shall have gypsum board attached to at least one side according to the Section R602.10.2 Method GB requirements.

i. Required bracing length for Methods DWB, WSP, SFB, PBS, PCP and HPS in braced wall lines located in one-story buildings and in the top story of two or three story buildings shall be permitted to be multiplied by 0.80 when an approved hold-down device with a minimum uplift design value of 800 pounds is fastened to the end studs of each braced wall panel in the braced wall line and to the foundation or framing below.

**TABLE R602.10.3.1**  
**MINIMUM LENGTH REQUIREMENTS FOR BRACED WALL PANELS**

SEISMIC DESIGN CATEGORY AND WIND SPEED	BRACING METHOD	HEIGHT OF BRACED WALL PANEL				
		8 ft	9 ft	10 ft	11 ft	12 ft
SDC A, B, C, D <sub>0</sub> , D <sub>1</sub> and D <sub>2</sub> Wind speed < 110 mph	DWB, WSP, SFB, PBS, PCP, HPS and Method GB when double sided	4' - 0"	4' - 0"	4' - 0"	4' - 5"	4' - 10"
	Method GB, single sided	8' - 0"	8' - 0"	8' - 0"	8' - 10"	9' - 8"

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

# Continuous Sheathing Method

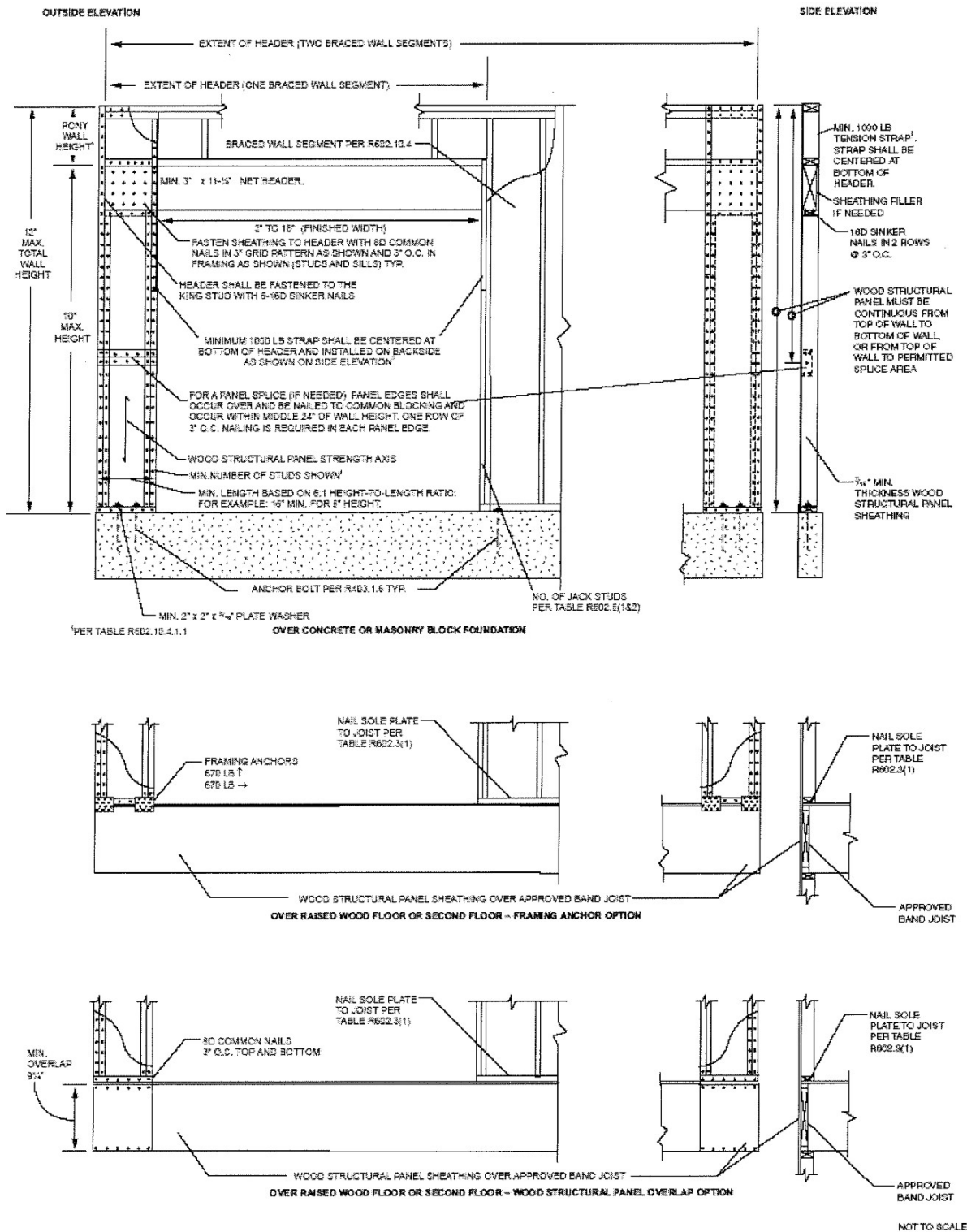
The CS method can be used when all areas of the BWL is covered with structural sheathing, this includes the areas above and below windows and doors. No other methods can be mixed with the CS method within the same BWL. The code allows the use of CS-G and CS-PF to be included within the same BWL, to address narrow panels adjacent to garage door, windows or doors. Although the designer can choose to mix methods throughout, when a BWL is referenced as a CS-WSP and the two perpendicular walls are of a different method (except WSP placed at the corner), a H/D device will be required. In a 100 mph zone, CS panels are allowed to be installed up to 12.5' off of a corner with a H/D device. The amount of bracing required by Table R602.10.1.2(1) must be provided along a CS BWL. Each corner panel must be a minimum of 24" unless the corner panel is adjacent to an opening then the contributing wall panel length must conform to Table R602.10.4.2. The contributing panels across the length of the BWL must also conform to Table R602.10.4.2 to contribute towards the total amount of bracing required. The CS method also requires corner stud construction to conform to Figure R602.10.4.4(1). The CS methods do not require the application of gypsum wallboard on the interior side of the wall.

## Panel Joints

**R602.10.8 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 block of a minimum 1 ½ inch thickness.

### Exceptions:

1. Block at horizontal joints shall not be required in wall segments that are not counted a *braced wall panels*.
2. Where the bracing length provided is at least twice the minimum length required by Tables R602.10.1.2(1) and R602.10.1.2(2) blocking at horizontal joints shall not be required in *braced wall panels* constructed using Methods WSP, SFB, GB, PBS or HPS. (NOTE: Under the 2009 IRC, CS methods are not included in this exception)
3. When Method GB panels are installed horizontally, blocking of horizontal joints is not required.



**FIGURE R602.10.4.1.1 METHOD CS-PF: CONTINUOUS PORTAL FRAME PANEL CONSTRUCTION**

## Checklist: Using bracing provisions of Chapter 5

- A. Panel width – Is each bracing panel the right minimum length? See **TABLE 5.12** for minimum length guidelines.

TABLE 5.12

Length  
requirements for  
braced  
wall panels

		Minimum Length					Contributing Length
		Wall Height					
Method		8'	9'	10'	11'	12'	
DWB , WSP, SFB, PBS, PCP, HPS, GB (double-sided)		48"	48"	48"	53"	58"	Actual <sup>1</sup>
GB (single-sided)		96"	96"	96"	106"	116"	Actual <sup>1</sup>
ABW	SDC A, B and C, wind speed < 110 mph	28"	32"	34"	38"	42"	48"
	SDC D <sub>0</sub> , D <sub>1</sub> and D <sub>2</sub> , wind speed < 110 mph	32"	32"	34"	NP	NP	48"
PFH	One-story	16"	16"	16"	18"	20"	48"
	Two-story	24"	24"	24"	27"	29"	48"
PFG	Garage	24"	24"	24"	NP	NP	1.5 x Actual <sup>1</sup>
Adjacent clear opening height							
CS-WSP, CS-SFB	≤ 64"	24"	27"	30"	33" <sup>2</sup>	36" <sup>2</sup>	Actual <sup>1</sup>
	68"	26"	27"	30"	33" <sup>2</sup>	36" <sup>2</sup>	
	72"	27"	27"	30"	33" <sup>2</sup>	36" <sup>2</sup>	
	76"	30"	29"	30"	33" <sup>2</sup>	36" <sup>2</sup>	
	80"	32"	30"	30"	33" <sup>2</sup>	36" <sup>2</sup>	
	84"	35"	32"	32"	33" <sup>2</sup>	36" <sup>2</sup>	
	88"	38"	35"	33"	33" <sup>2</sup>	36"	
	92"	43"	37"	35"	35" <sup>2</sup>	36" <sup>2</sup>	
	96"	48"	41"	38"	36" <sup>2</sup>	36" <sup>2</sup>	
	100"		44"	40"	38" <sup>2</sup>	38" <sup>2</sup>	
	104"		49"	43"	40" <sup>2</sup>	39" <sup>2</sup>	
	108"		54"	46"	43" <sup>2</sup>	41" <sup>2</sup>	
	112"			50"	45" <sup>2</sup>	43" <sup>2</sup>	
	116"			55"	48" <sup>2</sup>	45" <sup>2</sup>	
	120"			60"	52" <sup>2</sup>	48" <sup>2</sup>	
	124"				56" <sup>2</sup>	51" <sup>2</sup>	
	128"				61" <sup>2</sup>	54" <sup>2</sup>	
	132"				66" <sup>2</sup>	58" <sup>2</sup>	
	136"					62" <sup>2</sup>	
	140"					66" <sup>2</sup>	
	144"					72" <sup>2</sup>	
CS-G	24"	27"	30"	33"	36"	Actual <sup>1</sup>	
CS-PF	16"	18"	20"	22"	24"	Actual <sup>1</sup>	

For SI: 1 in. = 25.4 mm

NP = Not permitted

1. Actual length when greater than or equal to the minimum length.

2. Heights above 10 ft are not permitted for Method CS-SFB.

## IRC Braced Wall Line Worksheet

Project Address:

Method: 1. LIB GB DWB,WSP,SFB,PCP,HPS CS

Wall Support:  
(check one)  
1. Roof only (one story)  
2. Roof plus 1 floor (two story)  
3. Roof plus 2 floors (three story)

Braced wall line separation  
Walls running left to right on the plans: \_\_\_\_\_ feet apart  
Walls running from top to bottom on the plans: \_\_\_\_\_ feet apart

Braced panel height (height of top plates).  
  
Is adjustment factor per Table R602.10.1.2(1) footnote d, required?

Adjustment factor required:					
1 <sup>st</sup> floor _____ feet	No	Yes	Adjustment	factor	
2 <sup>nd</sup> floor _____ feet	No	Yes	Adjustment	factor	
3 <sup>rd</sup> floor _____ feet	No	Yes	Adjustment factor	_____	

Number of braced wall lines	Walls running left to right on the plans: Is adjustment factor per Table R602.10.1.2(1), footnote e required:	2 3 4 ≥ 5
	1. No Yes	
	Walls running from top to bottom on the plans: Is adjustment factor per Table R602.10.1.2(1), footnote e required:	2 3 4 ≥ 5
	2. No Yes	

Length of Braced Wall Panels	Walls running left to right on the plans:	Required _____ ft.	Provided _____ ft.
	Walls running from top to bottom on the plans:	_____ ft.	_____ ft.

Is the mean roof height ≤ 30'?	a. No Yes	If No, see Table R602.10.1.2(1), footnote b.
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Is the maximum eave to ridge height ≤ 10'?	a. No Yes	If No, see Table R602.10.1.2(1), footnote c.
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Is gypsum wall board to be installed on the inside of all braced wall panels?	1. No Yes	If No, see Table R602.10.1.2(1), footnote f.
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