1. Revise Table R602.3(1) as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a.b.c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2 ½" x 0.113")	-
2	Ceiling joists to plate, toe nail	3-8d (2 ½" x 0.113")	-
3	Ceiling joist not attached to parallel rafter, laps over partitions, face nail	3-10d	-
4	Collar tie to rafter, face nail, or 1-1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	-
5	Rafter to plate, toe nail	2-16d (3 ½ "x 0.135")	-
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	 4-16d (3 ½" x 0.135") 3-16d (3 ½" x 0.135")	-
	Wall		
7	Built-up corner studs –face nail	10d (3" x 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12"oc
9	Built-up header, two pieces with ½"spacer	16d (3½" × □0.135")	16" o.c. along each edge
10	Continued header, two pieces	16d (3½" × □0.135")	16" o.c. along each edge
11	Continuous header to stud, toe nail	4-8d (2 ½" x 0.113")	-
12	Double studs, face nail	10d (3" x 0.128")	24" o.c.
13	Double top plates, face nail	10d (3" x 0.128")	24" o.c
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3½" × □0.135")	-
15	Sole plate to joist or blocking, face nail	16d (3½" × □0.135")	16" o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d (3½" × □0.135")	16" o.c.
17	Stud to sole plate, toe nail	3-8d (2 ½" x 0.113") or 2-16d (3½" × □0.135")	-
18	Top or sole plate to stud, end nail	2-16d (3½" × □0.135")	-
19	Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	-
20	1" brace to each stud and plate, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
21	1" × 6" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
22	1" × 8" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 3 staples 1¾"	-
23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d (2 ½" x 0.113") 4 staples 1¾"	-
24	Joist to sill or girder, toe nail	3-8d (2 ½" x 0.113")	-
25	Rim joist to top plate, toe nail (roof applications also)	8d (2 ½" x 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" x 0.113")	6" o.c.
27	1" × 6" subfloor or less to each joist, face nail	24 27 2-8d (2 ½" x 0.113") 2 staples 1¾"	-
28	2" subfloor to joist or girder, blind and face nail	2-16d (3½" × □0.135")	-
29	2" planks (plank & beam – floor & roof)	2-16d (3½" × □0.135")	at each bearing
30	Built up girders and beams, 2-inch lumber layers	10d (3" x 0.128")	Nail each layer as follows: 32"□o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d (3½" × □0.135")	At each joist or rafter

(Remainder of table unchanged except item numbers)

2. Move existing Section R602.10.1.2.1 to new Section R602.3.5 and revise as follows:

R602.3.5 Braced wall panel uplift load path. Braced wall panels located at exterior walls that support roof rafters or trusses (including stories below top story) shall have the framing members connected in accordance with one of the following:

1. Fastening in accordance with Table R602.3(1) where:
    1.1. The basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, or
    1.2. The net uplift value at the top of a wall does not exceed 100 plf (146 N/mm). The net uplift value shall be determined in accordance with Section R802.11 and shall be permitted to be reduced by 60 plf (86 N/mm) for each full wall above.
2. Where the net uplift value at the top of a wall exceeds 100 plf (146 N/mm), installing approved uplift framing connectors to provide a continuous load path from the top of the wall to the foundation. The net uplift value shall be as determined in Item 1.2 above.
3. Wall sheathing and fasteners designed in accordance with accepted engineering practice to resist combined uplift and shear forces.

3. Delete Section R602.10 and replace with the following:

R602.10 Wall bracing. Buildings shall be braced in accordance with this section. 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 Section R301.1.

R602.10.1 Braced wall lines. For the purpose of determining the amount and location of bracing required in each story level of a building, braced wall lines shall be designated as straight lines in the building plan placed in accordance with this section.

R602.10.1.1 Length of a braced wall line. The length of a braced wall line shall be the distance between its ends. The end of a braced wall line shall be the intersection with a perpendicular braced wall line or an angled braced wall line as permitted in Section R602.10.1.4 or an exterior wall as shown in Figure R602.10.1.1.

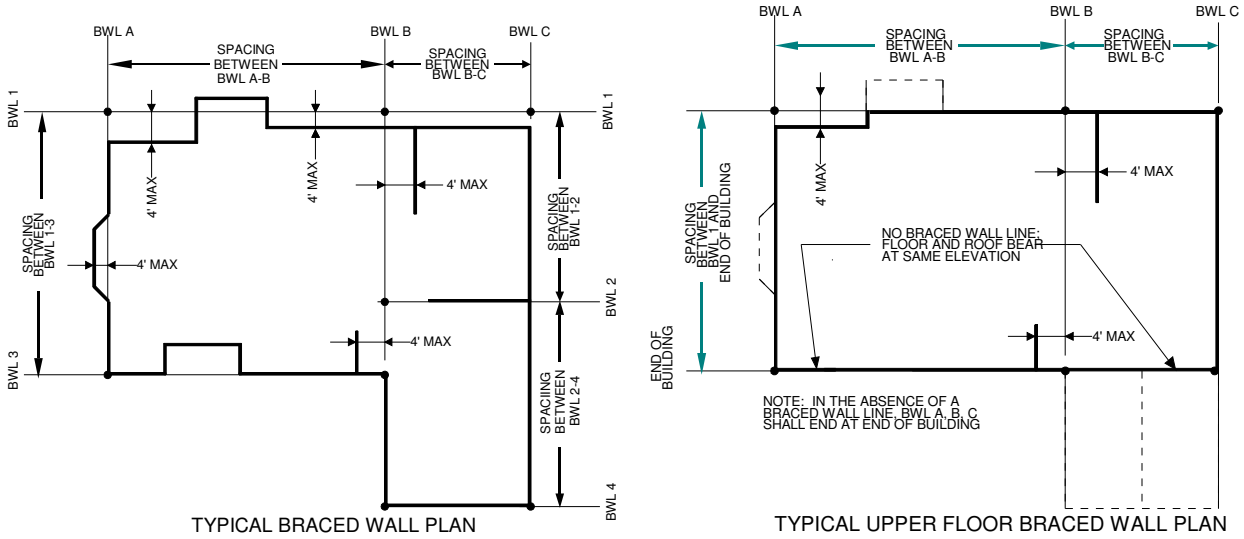


FIGURE R602.10.1.1
BRACED WALL LINES

R602.10.1.2 Offsets along a braced wall line. All exterior walls parallel to a braced wall line shall be permitted to offset up to 4 feet (1219 mm) from the designated braced wall line location as shown Figure R602.10.1.1. Interior walls used as bracing shall be permitted to offset up to 4 feet (1219 mm) from a braced wall line through the interior of the building as shown in Figure R602.10.1.1.

R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.

TABLE R602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
WIND BRACING	85 mph to <110 mph	Detached, townhouse	60 feet	None
SEISMIC BRACING	SDC A – C_1	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)
	SDC D_0, D_1, D_2	Detached, townhouses, one and two-story only	25 feet	Up to 35 feet to allow for a single room not to exceed 900 sq ft. Spacing of all other braced wall lines shall not exceed 25 feet.
	SDC D_0, D_1, D_2	Detached, townhouse	25 feet	Up to 35 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4).

For SI: 1 foot = 304.8 mm

R602.10.1.4 Angled walls. Any portion of a wall along a braced wall line shall be permitted to angle out of plane for a maximum diagonal length of 8 feet (2438 mm). Where the angled wall occurs at a corner, the length of the braced wall line shall be measured from the projected corner as shown in Figure R602.10.1.4. Where the diagonal length is greater than 8 feet (2438 m), it shall be considered a separate braced wall line and shall be braced in accordance with Section R602.10.1

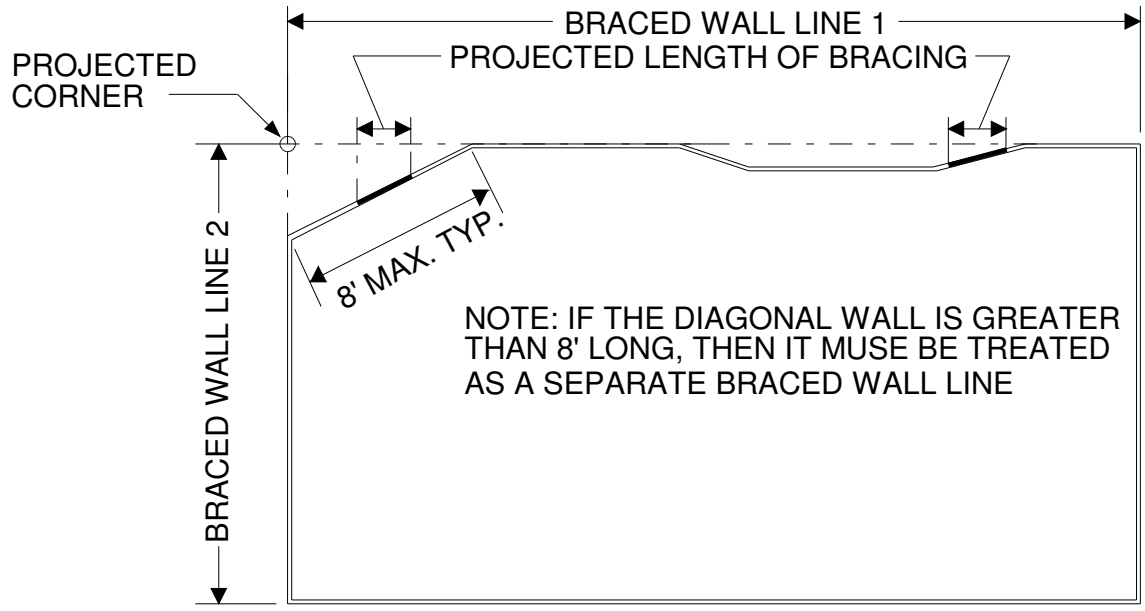


FIGURE R602.10.1.4
ANGLED WALLS

R602.10.2 Braced wall panels. Braced wall panels shall be full-height sections of wall that shall have no vertical or horizontal offsets. Braced wall panels shall be constructed and placed along a braced wall line in accordance with this section and the bracing methods specified in Section R602.10.4.

R602.10.2.1 Braced wall panel uplift load path. The bracing lengths in Table R602.10.3(1) apply only when uplift loads are resisted per Section R602.3.5.

R602.10.2.2 Locations of braced wall panels. A braced wall panel shall begin within 10 feet (3810 mm) from each end of a braced wall line as determined in Section R602.10.1.1. The distance between adjacent edges of braced wall panels along a braced wall line shall be no greater than 20 feet (6096 mm) as shown in Figure R602.10.2.2

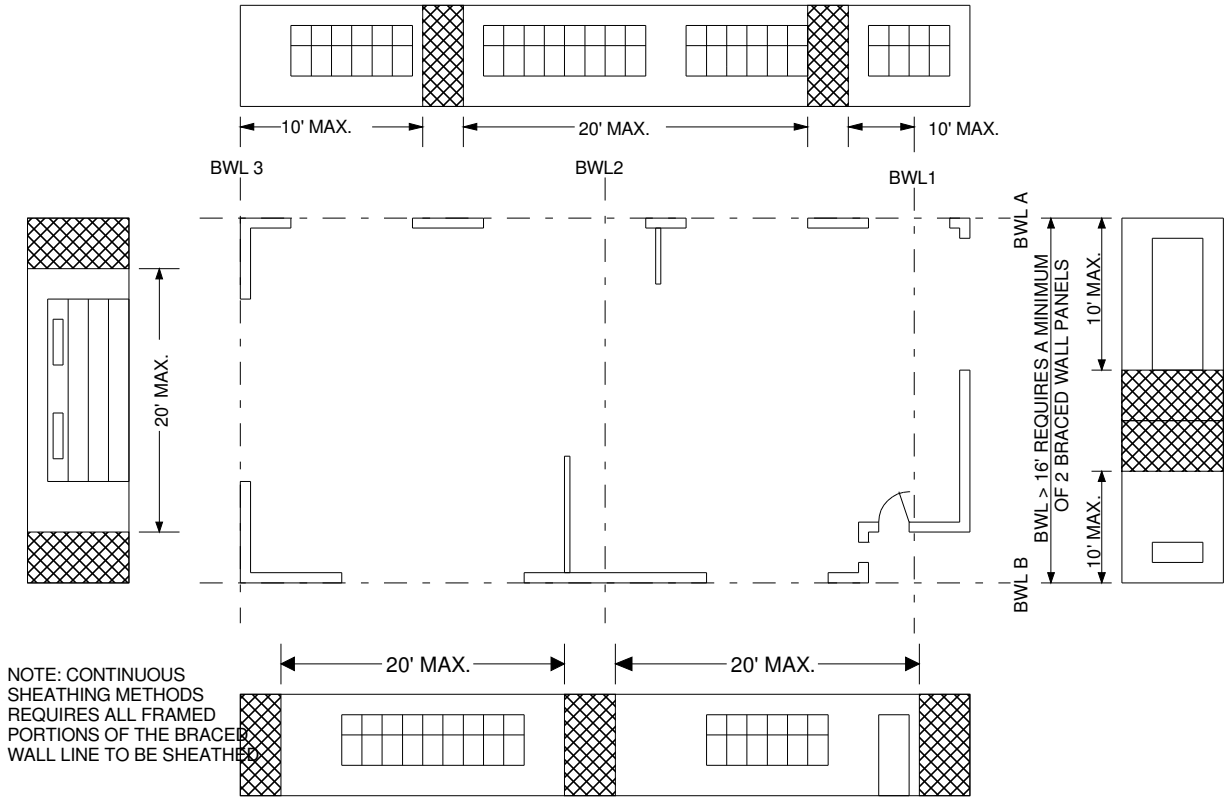


FIGURE R602.10.2.2
LOCATION OF BRACED WALL PANELS

R602.10.2.2.1 Location of braced wall panels in Seismic Design Categories D_0, D_1 and D_2. Braced wall panels shall be located at each end of a braced wall line.

> **Exception:** Braced wall panels constructed of Methods WSP and continuous sheathing methods as specified in Section R602.10.4 shall be permitted to begin no more than 10 feet (3048 mm) from each end of a braced wall line provided each end complies with one of the following.
>
> > 1. A minimum 24 in. wide (610 mm) panel for Methods WSP, CS-WSP, CS-G, CS-PF and 32 in. (813 mm) wide panel for Method CS-SFB is applied to each side of the building corner as shown in Condition 4 of Figure R602.10.7.
> > 2. The end of each braced wall panel closest to the end of the braced wall line shall have an 1,800 lb (8 kN) hold-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 as shown in Condition 5 of Figure R602.10.7.

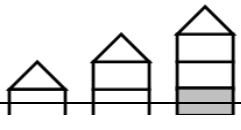
R602.10.2.3 Minimum number of braced wall panels. Braced wall lines with a length of 16 feet (4877 mm) or less shall have a minimum of two braced wall panels of any length or one braced wall panel equal to 48 inches (1219 mm) or more. Braced wall lines greater than 16 feet (4877 mm) shall have a minimum of two braced wall panels.

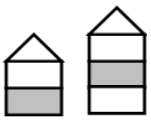
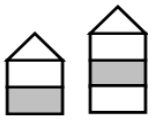
R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).
2. Detached buildings in Seismic Design Category C shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).
3. Townhouses in Seismic Design Category C or C_1 shall use the greater value determined from Table R602.10.3(1) or R602.10.3(3) and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) respectively.
4. All buildings in Seismic Design Categories D_0, D_1 and D_2 shall use the greater value determined from Table R602.10.3(1) or R602.10.3(3) and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) respectively.

Only braced wall panels parallel to the braced wall line shall contribute towards the required length of bracing of that braced wall line. Braced wall panels along an angled wall meeting the minimum length requirements of Tables R602.10.5 and R602.10.5.2 shall be permitted to contribute its projected length towards the minimum required length of bracing for the braced wall line as shown in Figure R602.10.1.4. Any braced wall panel on an angled wall at the end of a braced wall line shall contribute its projected length for only one of the braced wall lines at the projected corner.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

• 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 [a]			
Basic Wind Speed (mph)	**Story Location**	**Braced Wall Line Spacing (feet)**	**Method LIB [b]**	**Method GB (Double Sided)**	**Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB [c]**	**Methods CS-WSP, CS-G, CS-PF**
≤ 85		10	3.5	3.5	2.0	1.5
		20	6.0	6.0	3.5	3.0
		30	8.5	8.5	6.0	4.5
		40	11.5	11.5	6.5	5.5
		50	14.0	14.0	8.0	7.0
		60	16.5	16.5	9.5	8.0
		10	6.5	6.5	3.5	3.0
		20	11.5	11.5	6.5	5.5
		30	16.5	16.5	9.5	8.0
		40	21.5	21.5	12.5	10.5
		50	26.6	26.6	15.0	13.0
		60	31.5	31.5	18.0	15.5
		10	NP	9.0	5.5	4.5
		20	NP	17.7	10.0	8.5
		30	NP	24.5	14.0	12.0
		40	NP	32.0	18.0	15.5
		50	NP	39.0	22.5	19.0
		60	NP	46.5	26.5	22.5
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5

		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5
≤ 100		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	NP	7.5	6.0
		20	NP	NP	13.5	11.5
		30	NP	NP	19.5	16.5
		40	NP	NP	25.0	21.5
		50	NP	NP	31.0	25.5
		60	NP	NP	36.5	31.0
< 110		10	5.5	5.5	3.0	3.0
		20	10.0	10.0	6.0	5.0
		30	14.5	14.5	16.0	7.0
		40	18.5	18.5	20.5	9.0
		50	23.0	23.0	25.5	11.5
		60	27.5	27.5	30.0	13.5
		10	10.5	10.5	6.0	5.0
		20	19.0	19.0	11.0	9.5
		30	27.5	27.5	16.0	13.5
		40	36.0	36.0	20.5	17.5
		50	44.0	44.0	25.5	21.5
		60	52.5	52.5	30.0	25.5
		10	NP	NP	9.0	7.5
		20	NP	NP	16.5	14.0
		30	NP	NP	23.5	20.0
		40	NP	NP	30.5	.26.0
		50	NP	NP	37.5	32.0
		60	NP	NP	44.5	37.5

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Linear interpolation shall be permitted.

b. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).

c. Method CS-SFB does not apply where the wind speed is greater than 100 mph.

TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor	APPLICABLE METHODS
Exposure category	One-story structure	B	1.00	All Methods
		C	1.20	
		D	1.50	
	Two-story structure	B	1.00	
		C	1.30	
		D	1.60	
	Three-story structure	B	1.00	
		C	1.40	

		D	1.70	
Roof eave-to-ridge height	Roof only	≤ 5 feet	0,70	
		10 feet	1.00	
		15 feet	1.30	
		20 feet	1.60	
	Roof +1 Floor	≤ 5 feet	0,85	
		10 feet	1.00	
		15 feet	1.15	
		20 feet	1.30	
	Roof + 2 Floors	≤ 5 feet	0.90	
		10 feet	1.00	
		15 feet	1.10	
		20 feet	Not permitted	
Wall height adjustment	Any story	8 feet	0.90	
		9 feet	0.95	
		10 feet	1.00	
		11 feet	1.05	
		12 feet	1.10	
Number of braced wall lines (per plan direction) [c]	Any story	3	1.30	
		4	1.45	
		≥ 5	1.60	
Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c.at panel edges, including top and bottom plates, and all horizontal joints blocked	0.70	GB

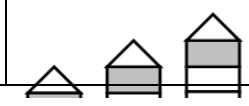
For SI: 1 foot = 305 mm, 1 lb = 4.48 N.

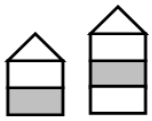
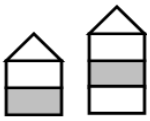
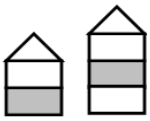
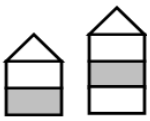
a. Linear Interpolation shall be permitted.

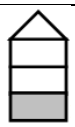
b. The total adjustment factor is the product of all applicable adjustment factors.

c. The adjustment factor is permitted to be 1.0 when determining bracing amounts for intermediate braced wall lines provided the bracing mounts on adjacent braced wall lines are based on a spacing and number that neglects the intermediate braced wall line.

TABLE R602.10.3(3)
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY

• **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** [a]				
Basic Wind Speed (mph)	**Story Location**	**Braced Wall Line Spacing (feet)**	**Method LIB** [c]	**Method GB**	**Methods DWB, SFB, PBS, PCP, HPS, CS-SFB** [d]	**Method WSP**	**Methods CS-WSP, CS-G**
C Townhouses only		10	2.5	2.5	2.5	1.6	1.4
		20	5.0	5.0	5.0	3.2	2.7
		30	7.5	7.5	7.5	4.8	4.1

		40	10	10	10	6.4	5.4
		50	12.5	12.5	12.5	9.0	6.8
		10	NP	4.5	4.5	3.0	2.6
		20	NP	9.0	9.0	6.0	5.1
		30	NP	13.5	13.5	9.0	7.7
		40	NP	18.0	18.0	12.0	10.2
		50	NP	22.5	22.5	15.0	12.8
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.9
		50	NP	30.0	30.0	22.5	19.1
D_0		10	NP	2.8	2.8	1.8	1.6
		20	NP	5.5	5.5	3.6	3.1
		30	NP	8.3	8.3	5.4	4.6
		40	NP	11.0	11.0	7.2	6.1
		50	NP	13.8	13.8	9.0	7.7
		10	NP	5.3	5.3	3.8	3.2
		20	NP	10.5	10.5	7.5	6.4
		30	NP	15.8	15.8	11.3	9.6
		40	NP	21.0	21.0	15.3	12.8
		50	NP	26.3	26.3	18.8	16.0
		10	NP	7.3	7.3	5.3	4.5
		20	NP	14.5	14.5	10.5	9.0
		30	NP	21.8	21.8	15.8	13.4
		40	NP	29.0	29.0	21.0	17.9
		50	NP	36.3	36.3	26.3	22.3
D_1		10	NP	3.0	3.0	2.0	1.7
		20	NP	6.0	6.0	4.0	3.4
		30	NP	9.0	9.0	6.0	5.1
		40	NP	12.0	12.0	8.0	6.8
		50	NP	15.0	15.0	10.0	8.5
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.3
		50	NP	30.0	30.0	22.5	19.1
		10	NP	8.5	8.5	6.0	5.1
		20	NP	17.0	17.0	12.0	10.2
		30	NP	25.5	25.5	18.0	15.2
		40	NP	34.0	34.0	24.0	20.4
		50	NP	42.5	42.5	30.0	25.5
D_2		10	NP	4.0	4.0	2.5	2.1
		20	NP	8.0	8.0	5.0	4.3
		30	NP	12.0	12.0	7.5	6.4
		40	NP	16.0	16.0	10	8.5
		50	NP	20.0	20.0	12.5	10.6
		10	NP	7.5	7.5	5.5	4.7
		20	NP	15.0	15.0	11.0	9.4
		30	NP	22.5	22.5	16.5	14.0
		40	NP	30.0	30.0	22.0	18.7
		50	NP	37.5	37.5	27.5	23.4
		10	NP	NP	NP	NP	NP

		20	NP	NP	NP	NP	NP
		30	NP	NP	NP	NP	NP
		40	NP	NP	NP	NP	NP
		50	NP	NP	NP	NP	NP

For SI: 1 foot 305 mm

a. Linear interpolation shall be permitted.

b. Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the Sds values associated with the Seismic Design Categories shall be permitted when a site-specific Sds value is determined in accordance with Section 1613.5 of the International Building Code.

c. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).

d. Method CS-SFB applies in SDC C only.

TABLE R602.10.3(4)
SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor	APPLICABLE METHODS
Story height (Section 301.3)	Any story	≤ 10 ft >10 ≤ 12 ft	1.0 1.2	All methods
Braced wall line spacing, townhouses in SDC C, C_1	Any story	≤ 35 ft >35 ≤ 50 ft	1.0 1.42	
Braced wall line spacing, in SDC D0, D1, D2 [c]	Any story	> 25 ≤ 30 ft > 30 ≤ 35 ft	1.2 1.4	
Wall dead load	Any story	> 8 ≤ 15 ft < 8 psf	1.0 0.85	
Roof/ceiling dead load for wall supporting	Roof only or roof plus one or two stories	≤ 15 psf	1.0	
	Roof only	> 15 ≤ 25 psf	1.2	
	Roof plus one or two stories	> 15 ≤ 25 psf	1.1	
Walls with stone or masonry veneer	Any story	See Section R703.7		
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.5	DWB, WSP, SFB, PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB

For SI: 1 psf = 47,8 N/m2.

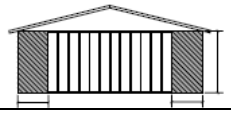
a. Linear interpolation shall be permitted.

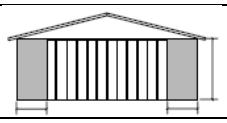
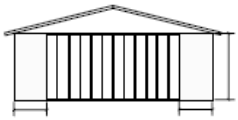
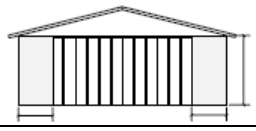
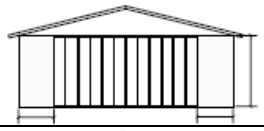
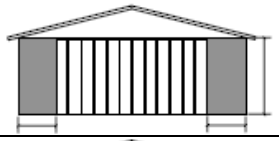
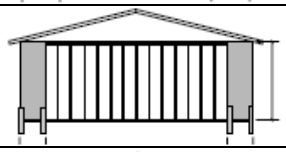
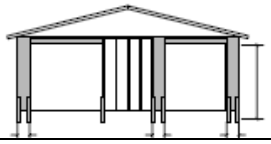
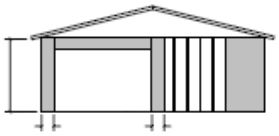
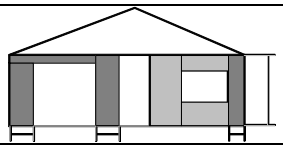
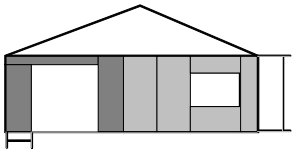
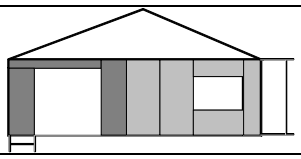
b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.

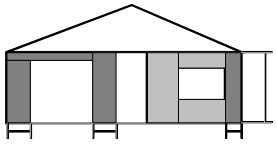
c. The length-to-width ratio for the floor/roof *diaphragm* shall not exceed 3:1. The top plate lap splice nailing shall be a minimum of 12-16d nails on each side of the splice.

R602.10.4 Construction methods for braced wall panels. Intermittent and continuously sheathed braced wall panels shall be constructed in accordance with this section and the methods listed in Table R602.10.4.

TABLE R602.10.4
BRACING METHODS

METHODS, MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA [a]	
LIB Let-in-bracing	1x4 wood or approved metal straps at 45° to 60° angles for maximum 16" stud spacing		Wood: 2-8d common nails or 3-8d (2 ½" long x 0.113" dia.) nails	Wood: per stud and top and bottom plates
			Metal strap: per manufacturer	Metal: per manufacturer
DWB Diagonal wood boards	3/4" (1" nominal) for maximum 24" stud spacing		2-8d (2½" long x 0.113" dia.) nails or 2 - 1¾" long staples	Per stud

WSP Wood structural panel (See Section R604	3/8"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
			Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
SFB Structural fiberboard sheathing	1/2" or 25/32" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) 13/4" long x 0.12" dia. (for 25/32" thick sheathing) galvanized roofing nails or 8d common (2½" long x0.131 dia.) nails	3" edges 6" field
GB [d] Gypsum board (double sided)	1/2"		Nails or screws per Table R602.3(1) for exterior locations Nails or screws per Table R702.3.5 for interior locations	For all braced wall panel locations: 7" edges (including top and bottom plates) 7" field
PBS Particleboard sheathing (See Section R605)	3/8" or 1/2" for maximum16" stud spacing		For 3/8", 6d common (2" long x0.113 dia.) nails For ½", 8d common (2½" long x0.131 dia.) nails	3" edges 6" field
PCP Portland cement plaster	See Section R703.6 for maximum 16" stud spacing		1½" long, 11 gage, 7/16" dia. head nails or 7/16" long, 16 gage staples	6" o.c. on all framing members
HPS Hardboard panel siding	7/16" for maximum 16" stud spacing		0.092" dia., 0.225" head nails with length to accommodate 1½" penetration into studs	4" edges 8" field
ABW Alternate braced wall	3/8"		See Section R602.10.6.1	See Section R602.10.6.1
PFH Portal frame with hold-downs	3/8"		See Section R602.10.6.2	See Section R602.10.6.2
PFG Portal frame at garage	7/16"		See Section R602.10.6.3	See Section R602.10.6.3
CS-WSP Continuously sheathed wood structural panel	3/8"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
			Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
CS-G [b,c] Continuously sheathed wood structural panel adjacent to garage openings	3/8"		See Method CS-WSP	See Method CS-WSP
CS-PF Continuously sheathed portal frame	7/16"		See Section R602.10.6.4	See Section R602.10.6.4

CS-SFB Continuously sheathed structural fiberboard	1/2" or 25/32" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) 13/4" long x 0.12" dia. (for 25/32" thick sheathing) galvanized roofing nails or 8d common (2½" long x0.131 dia.) nails	3" edges 6" field

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Adhesive attachment of wall sheathing, including Method GB, shall not be permitted in Seismic Design Categories C, D0, D1 and D2.
b. Applies to panels next to garage door opening when supporting gable end wall or roof load only. May only be used on one wall of the garage. In Seismic Design Categories D0, D1, and D2, roof covering dead load may not exceed 3 psf (0.14 kN/m2).
c. Garage openings adjacent to a Method CS-G panel shall be provided with a header in accordance with Table R502.5(1). A full height clear opening shall not be permitted adjacent to a Method CS-G panel.
d. Method CS-SFB does not apply in Seismic Design Categories D_0, D_1 and D_2 and in areas where the wind speed exceeds 100 mph.

R602.10.4.1 Mixing methods. Mixing of bracing methods shall be permitted as follows:

1. Mixing intermittent bracing and continuous sheathing methods from story to story shall be permitted.
2. Mixing intermittent bracing methods from braced wall line to braced wall line within a story shall be permitted. Within Seismic Design Categories A, B, C_1 and C or in regions where the basic wind speed is less than or equal to 100 mph, mixing of intermittent bracing and continuous sheathing methods from braced wall line to braced wall line within a story shall be permitted.
3. Mixing intermittent bracing methods along a braced wall line shall be permitted in Seismic Design Categories A and B, and detached dwellings in Seismic Design Category C or C_1 provided the length of required bracing in accordance with Table R602.10.3(1) or R602.10.3(3) is the highest value of all intermittent bracing methods used.
4. Mixing of continuous sheathing methods CS-WSP, CS-G and CS-PF along a braced wall line shall be permitted.

In Seismic Design Categories A and B, and for detached one- and two-family dwellings in Seismic Design Category C or C_1, mixing of intermittent bracing methods along the interior portion of a braced wall line with continuous sheathing methods CS-WSP, CS-G and CS-PF along the exterior portion of the same braced wall line shall be permitted. The length of required bracing shall be the highest value of all intermittent bracing methods used in accordance with Table R602.10.3(1) or R602.10.3(3) as adjusted by Tables R602.10.3(2) and R602.10.3(4), respectively.. The requirements of Section R602.10.7 shall apply to each end of the continuously sheathed portion of the braced wall line.

1.

R602.10.4.2 Continuous sheathing methods. Continuous sheathing methods require structural panel sheathing to be used on all sheathable surfaces on one side of a braced wall line including areas above and below openings and gable end walls and shall meet the requirements of Section R602.10.7.

R602.10.4.3 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 ½ inch (12.7 mm) in thickness and be fastened with nails or screws in accordance with Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum wall board. Spacing of fasteners at panel edges for gypsum wall board opposite Method LIB bracing shall not exceed 8 inches (203 mm). Interior finish material shall not be glued in Seismic Design Categories D_0, D_1 and D_2.

Exceptions:

1. Interior finish material is not required opposite wall panels that are braced in accordance with Method GB, ABW, PFH, PFG and CS-PF, unless otherwise required by Section R302.6.
2. An approved interior finish material with an in-plane shear resistance equivalent to gypsum board shall be permitted to be substituted, unless otherwise required by Section R302.6.
3. Except for Method LIB, gypsum wall board is permitted to be omitted provided the required length of bracing in Tables R602.10.3(1) and R602.10.3(3) is multiplied by the appropriate adjustment factor in Tables R602.10.3(2) and R602.10.3(4) respectively, unless otherwise required by Section R302.6.

R602.10.5 Minimum length of a braced wall panel. The minimum length of a braced wall panel shall comply with Table R602.10.5. For Methods CS-WSP and CS-SFB, the minimum panel length shall be based on the adjacent clear opening height in accordance with Table R602.10.5 and Figure R602.10.5.

When a panel has an opening on either side of differing heights, the taller opening height shall be used to determine the panel length.

R602.10.5.1 Contributing length. For purposes of computing the required length of bracing in Table R602.10.3(1) and R602.10.3(3), the contributing length of each braced wall panel shall be as specified in Table R602.10.5

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD		MINIMUM LENGTH [a] (in) Wall Height					CONTRIBUTING LENGTH (in)
		8 ft	9 ft	10 ft	11 ft	12 ft	
DWG, WSP, SFB, PBS, PCP, HPS		48	48	48	53	58	Actual [b]
GB		48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB		55	62	69	NP		Actual [b]
ABW	SDC A, B, C and C_1 wind speed < 110 mph	28	32	34	38	42	48
	SDC D_0, D_1 and D_2, wind speed < 110 mph	32	32	34	NP	NP	
PFH	Supporting roof only	16	16	16	18 [c]	20 [c]	48
	Supporting one story and roof	24	24	24	27 [c]	29 [c]	48
PFG		24	27	30	33 [d]	36 [d]	1.5 x Actual [b]
CS-G		24	27	30	33	36	Actual [b]
CS-PF		16	18	20	22 [e]	24 [e]	Actual [b]
CS-WSP, CS-SFB	Adjacent clear opening height (in)						Actual [b]
	≤ 64	24	27	30	33	36	
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

For SI: 1 inch = 25.4 mm
NP = Not permitted

a. Linear interpolation shall be permitted.
b. Use the actual length when it is greater than or equal to the minimum length.
c. Maximum header height for PFH is 10' per Figure R602.10.6.2, but wall height may be increased to 12' with pony wall.
d. Maximum opening height for PFG is 10' per Figure R602.10.6.3, but wall height may be increased to 12' with pony wall.
e. Maximum opening height for CS-PF is 10' per Figure R602.10.6.4, but wall height may be increased to 12' with pony wall

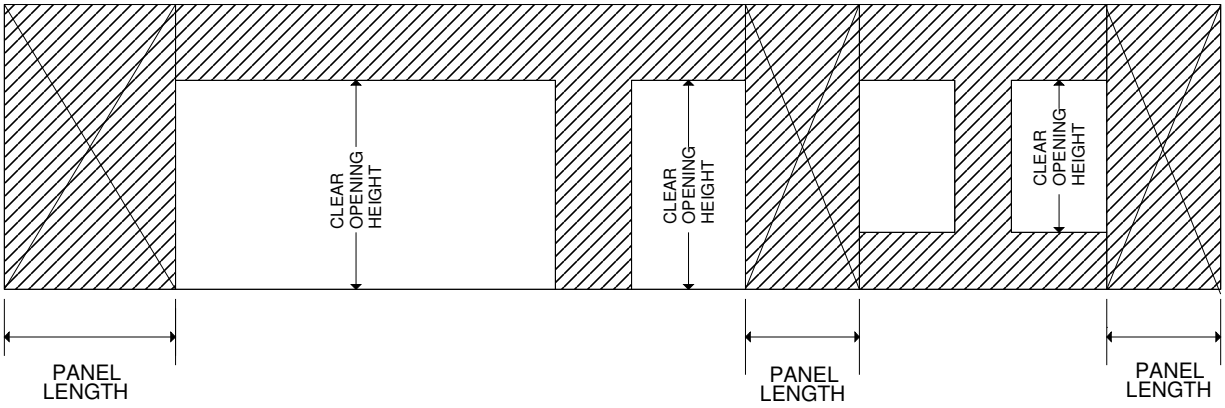


FIGURE R602.10.5
BRACED WALL PANELS WITH CONTINUOUS SHEATHING

R602.10.5.2 Partial credit. 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 considered a braced wall panel and shall be permitted to partially contribute towards the required length of bracing in Table R602.10.3(1) and R602.10.3(3), and the contributing length shall be determined from Table R602.10.5.2.

TABLE R602.10.5.2
PARTIAL CREDIT FOR BRACED WALL PANELS LESS THAN 48 INCHES IN ACTUAL LENGTH

Actual Length of Braced Wall Panel (in)	Contributing Length of Braced Wall Panel (in) [a]	
	8 ft Wall Height	9 ft Wall Height
48	48	48
42	36	36
36	27	N/A

For SI: 1 inch = 25.4mm
N/A = Not Allowed
a. Linear interpolation shall be permitted.

R602.10.6 Construction of Methods ABW, PFH, PFG and CS-PF. Methods ABW, PFH, PFG and CS-PF shall be constructed as specified in Sections R602.10.6.1 through R602.10.6.4.

R602.10.6.1 Method ABW: Alternate braced wall panels. Method ABW braced wall panels shall be constructed in accordance with Figure R602.10.6.1. The hold-down force shall be in accordance with Table R602.10.6.1.

TABLE R602.10.6.1
MINIMUM HOLD-DOWN FORCES FOR METHOD ABW BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED	SUPPORTING/STORY	HOLD DOWN FORCE (lb)				
		Height of Braced Wall Panel				
		8 ft	9 ft	10 ft	11 ft	12 ft
SDC A, B, C_1 and C Wind speed < 110 mph	One story	1800	1800	1800	2000	2200
	First of two story	3000	3000	3000	3300	3600
SDC D_0, D_1 and D_2 Wind speed < 110 mph	One story	1800	1800	1800	NP [a]	NP [a]
	First of two story	3000	3000	3000	NP [a]	NP [a]

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N
NP = Not Permitted.

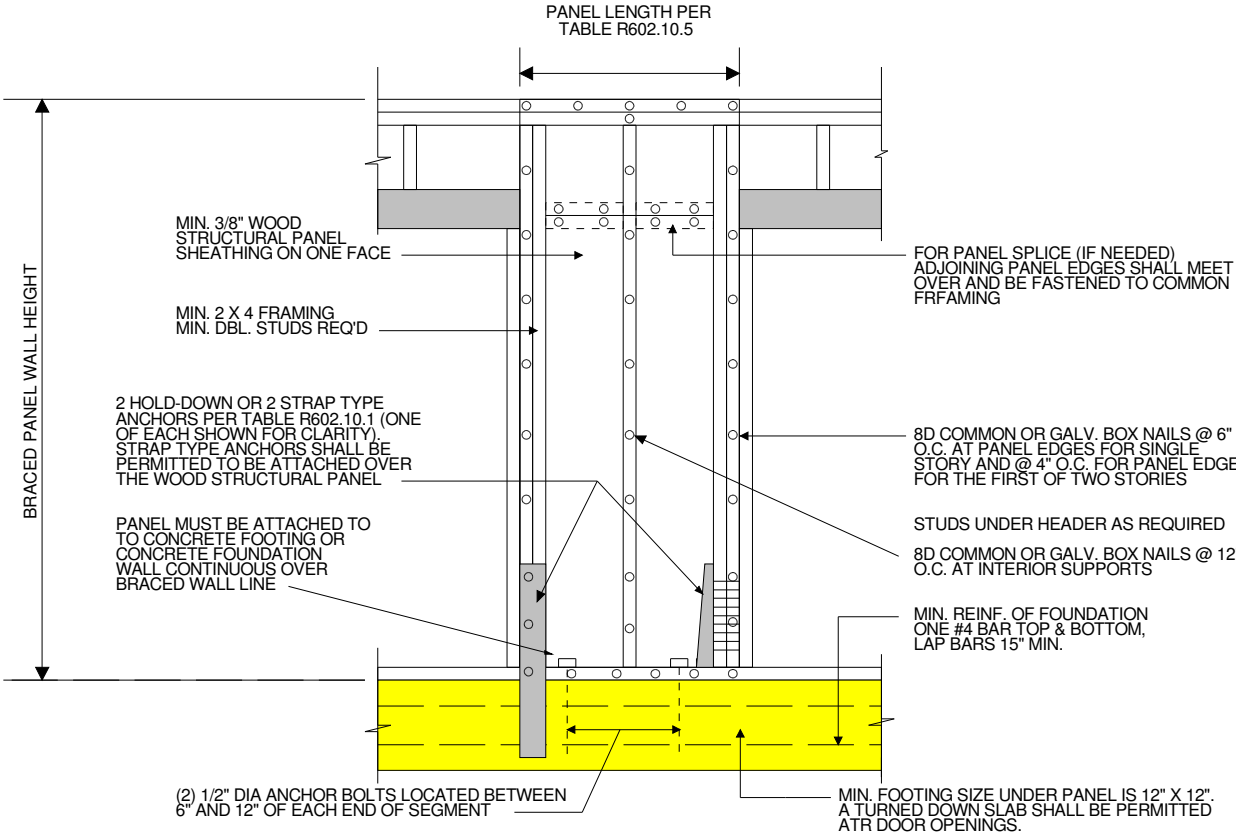
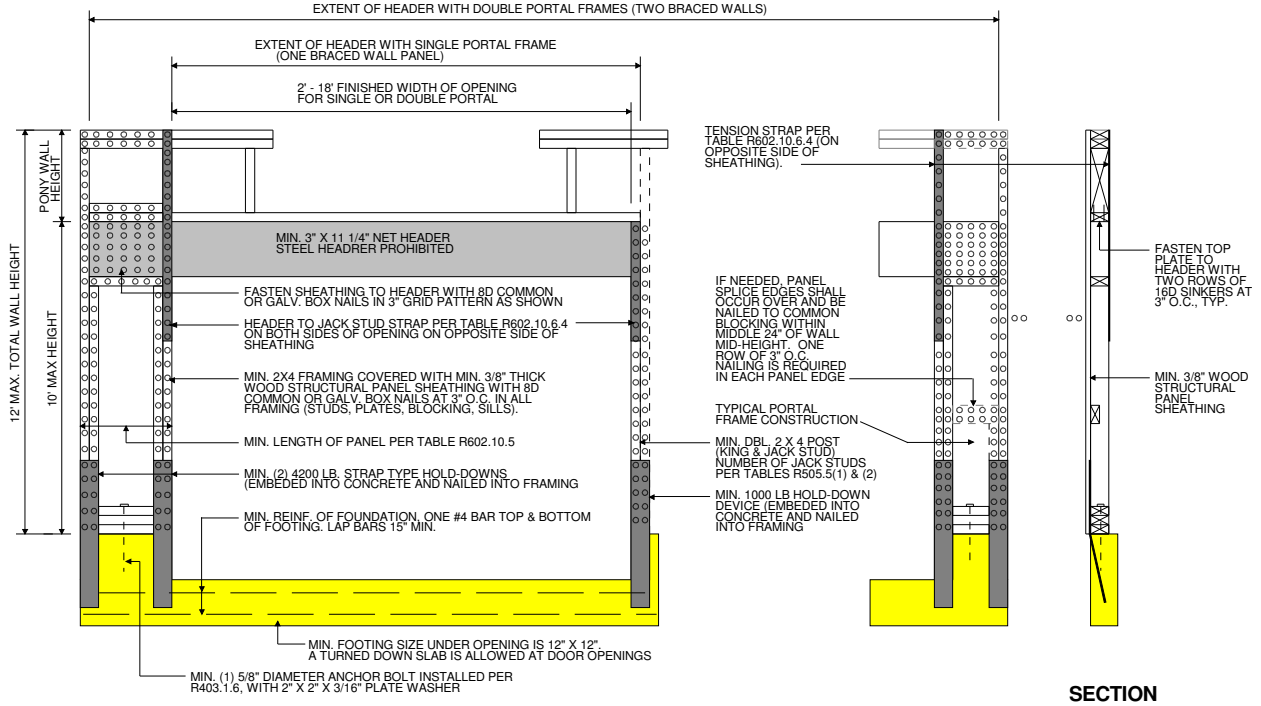


FIGURE R602.10.6.1
METHOD ABW: ALTERNATE BRACED WALL PANEL

R602.10.6.2 Method PFH: Portal frame with hold-downs. Method PFH braced wall panels shall be constructed in accordance with Figure R602.10.6.2.



FRONT ELEVATION **SECTION**

FIGURE R602.10.6.2
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS

R602.10.6.3 Method PFG: Portal frame at garage door openings in Seismic Design Categories A, B and C.
Where supporting a roof or one story and a roof, a Method PFG braced wall panel constructed in accordance with Figure R602.10.6.3 shall be permitted on either side of garage door openings.

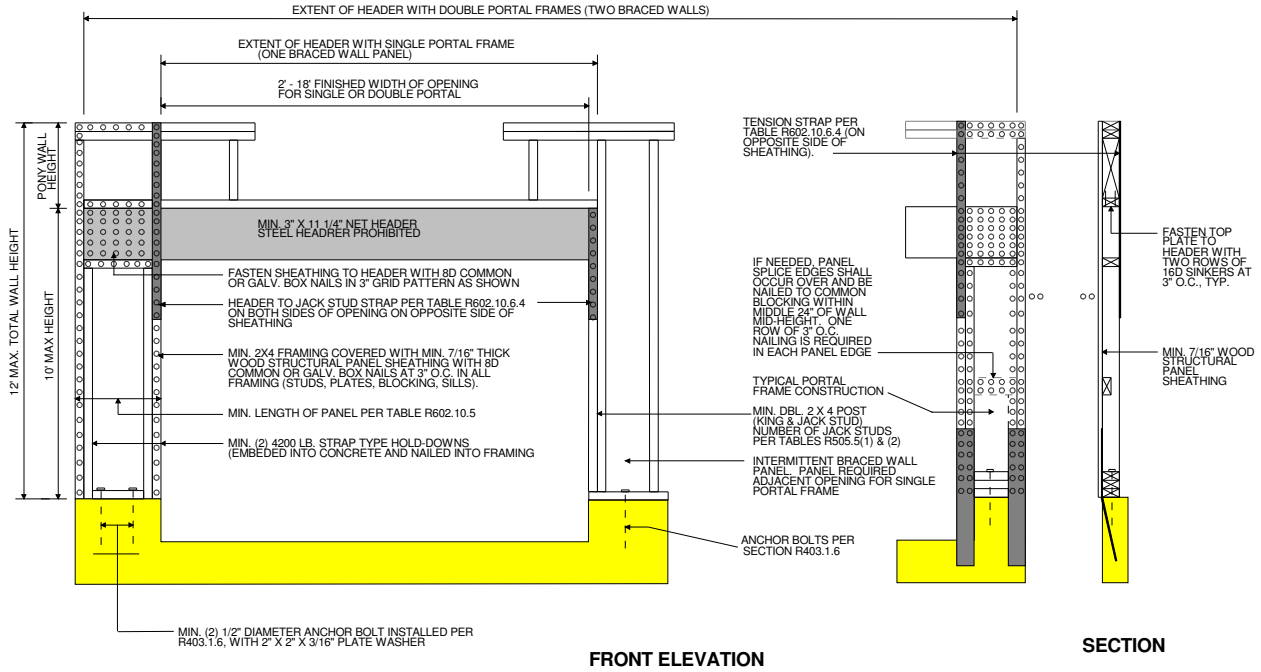


FIGURE R602.10.6.3
METHOD PFG: PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

R602.10.6.4 Method CS-PF: Continuously sheathed portal frame. Continuously sheathed portal frame braced wall panels shall be constructed in accordance with Figure R602.10.6.4 and Table R602.10.6.4. The number of continuously sheathed portal frame panels in a single braced wall line shall not exceed four.

TABLE R602.10.6.4
TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)	MAXIMUM OPENING WIDTH (ft)	TENSION STRAP CAPACITY REQUIRED (lb) [a, b]					
				Basic Wind Speed (mph)					
				85	90	100	85	90	100
				Exposure B			Exposure C		
2x4 No. 2 Grade	0	10	18	1000	1000	1000	1000	1000	1000
	1	10	9	1000	1000	1000	1000	1000	1275
			16	1000	1000	1750	1800	2325	3500
			18	1000	1200	2100	2175	2725	DR
	2	10	9	1000	1000	1025	1075	1550	2500
			16	1525	2025	3125	3200	3900	DR
			18	1875	2400	3575	3700	DR	DR
	2	12	9	100	1200	2075	2125	2750	4000
			16	2600	3200	DR	DR	DR	DR
			18	3175	3850	DR	DR	DR	DR

	4	12	9	1775	2350	3500	3550	DR	DR
			18	4175	DR	DR	DR	DR	DR
2x6 Stud Grade			9	1000	1000	1325	1375	1750	2550
			16	1650	2050	2925	3000	3550	DR
			18	2025	2450	3425	3500	4100	DR
			9	1125	1500	2225	2275	2775	3800
			16	2650	3150	DR	DR	DR	DR
			18	3150	3675	DR	DR	DR	DR

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N

a. DR = design required

b. Strap shall be installed in accordance with manufacturer's recommendations.

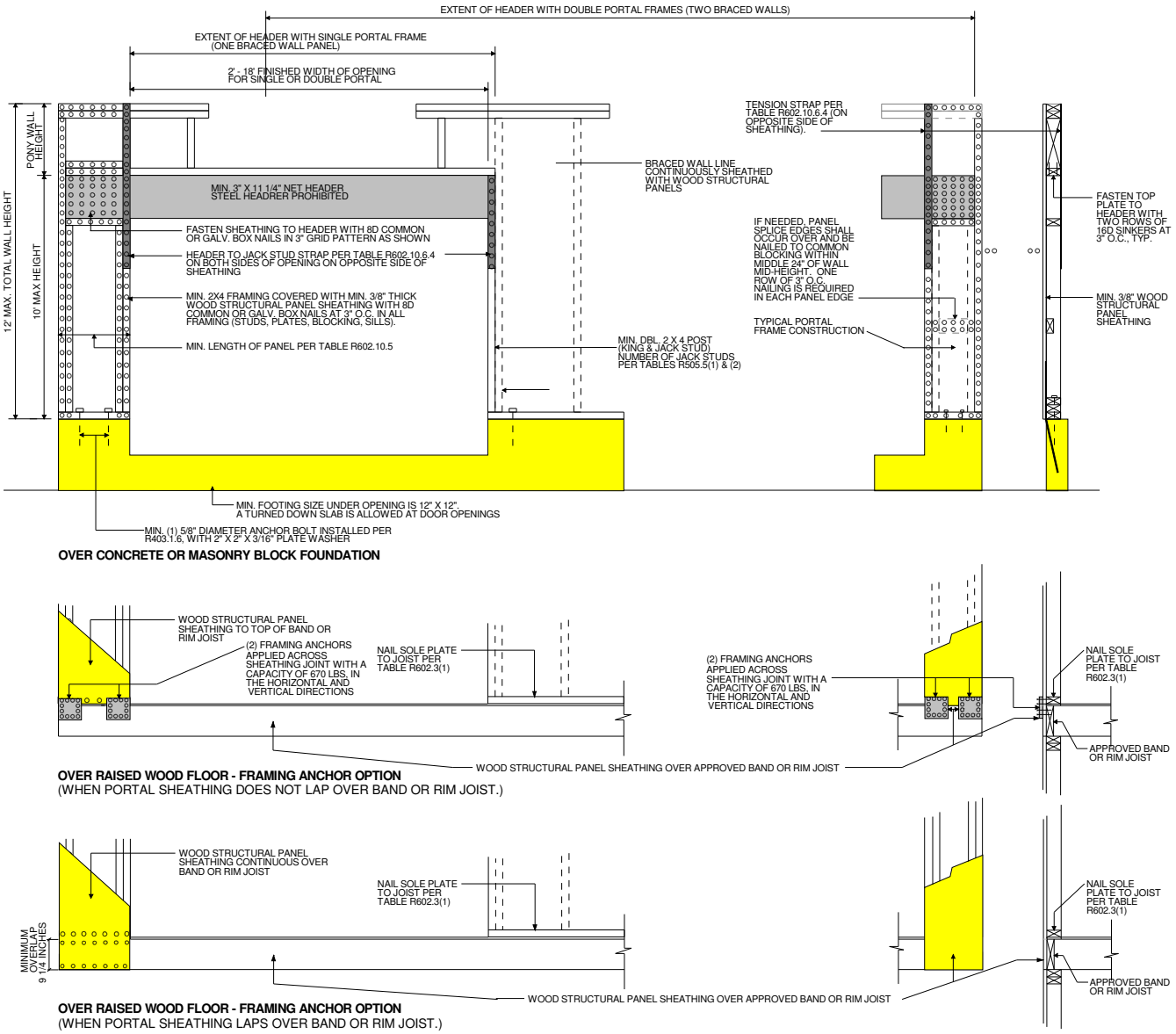
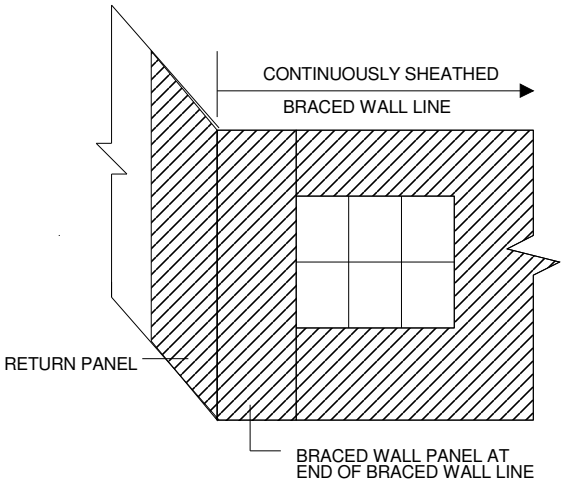
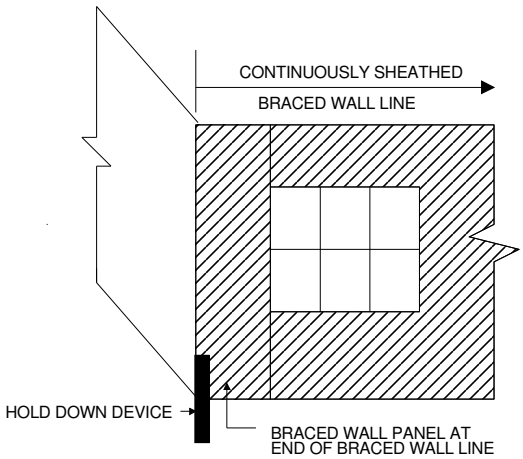


FIGURE R602.10.6.4
METHOD CS-PF: CONTINUOUSLY SHEATHED PORTAL FRAME PANEL CONSTRUCTION

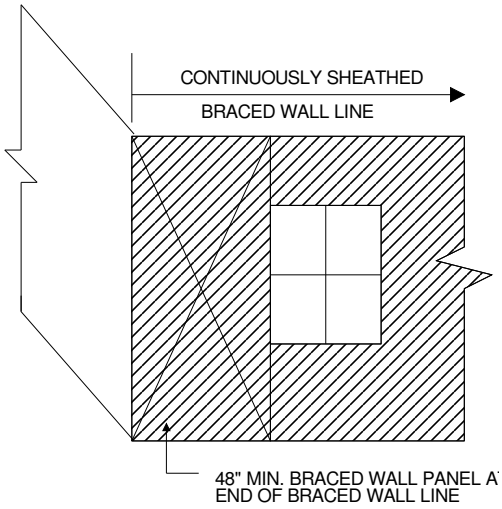
R602.10.7 Ends of braced wall lines with continuous sheathing. Each end of a braced wall line with continuous sheathing shall have one of the conditions shown in Figure R602.10.7.



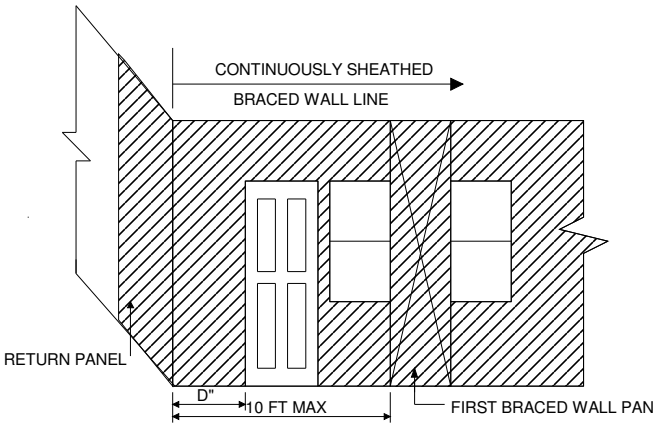
END CONDITION 1



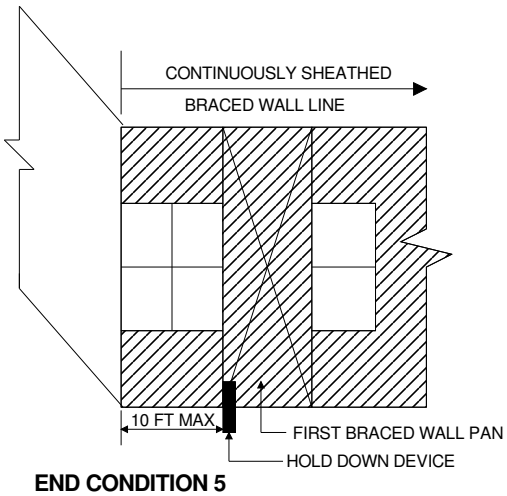
END CONDITION 2



END CONDITION 3



END CONDITION 4



END CONDITION 5

REQUIREMENTS

RETURN PANEL: 24" FOR WALL LINES SHEATHED W
WOOD STRUCTURAL PANELS.
32" FOR WALL LINES SHEATHED W
STRUCTURAL FIBERBOARD

DISTANCE "D": 24" FOR WALL LINES SHEATHED W
WOOD STRUCTURAL PANELS.
32" FOR WALL LINES SHEATHED W
STRUCTURAL FIBERBOARD.

HOLD DOWN DEVICE: 800 LB. CAPACITY, FASTENE
TO THE EDGE OF THE BRACED WA
PANEL CLOSEST TO THE CORNER
AND TO THE FOUNDATION OR FLC
FRAMING BELOW.

FIGURE R602.10.7
END CONDITIONS FOR BRACED WALL LINES WITH CONTINUOUS SHEATHING

R602.10.8 Braced wall panel connections. Braced wall panels shall be connected to floor framing or foundations as follows:

1. Where joists are perpendicular to a braced wall panel above or below, a rim joist, band joist or blocking shall be provided along the entire length of the braced wall panel in accordance with Figure R602.10.8(1). Fastening of top and bottom wall plates to framing, rim joist, band joist and/or blocking shall be in accordance with Table R602.3(1).
2. Where joists are parallel to a braced wall pan2el above or below, a rim joist, end joist or other parallel framing member shall be provided directly above and below the braced wall panel in accordance with Figure R602.10.8(2). Where a parallel framing member cannot be located directly above and below the panel, full depth blocking at 16 inch (406 mm) spacing shall be provided between the parallel framing members to each side of the braced wall panel in accordance with Figure R602.10.8(2). Fastening of blocking and wall plates shall be in accordance with Table R602.3(1) and Figure R602.10.8(2).
3. Connections of braced wall panels to concrete or masonry shall be in accordance with Section R403.1.6.

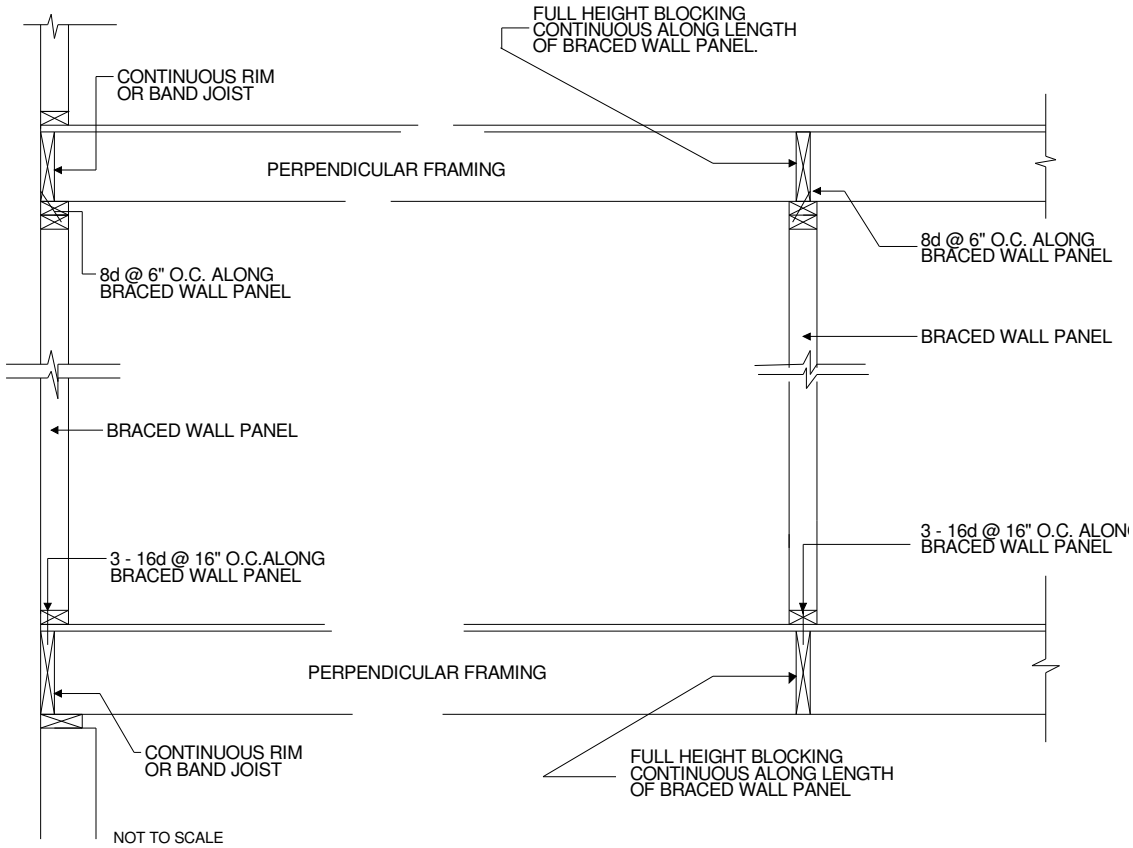


FIGURE R602.10.8(1)
BRACED WALL PANEL CONNECTION WHEN
PERPENDICULAR TO FLOOR/CEILING FRAMING

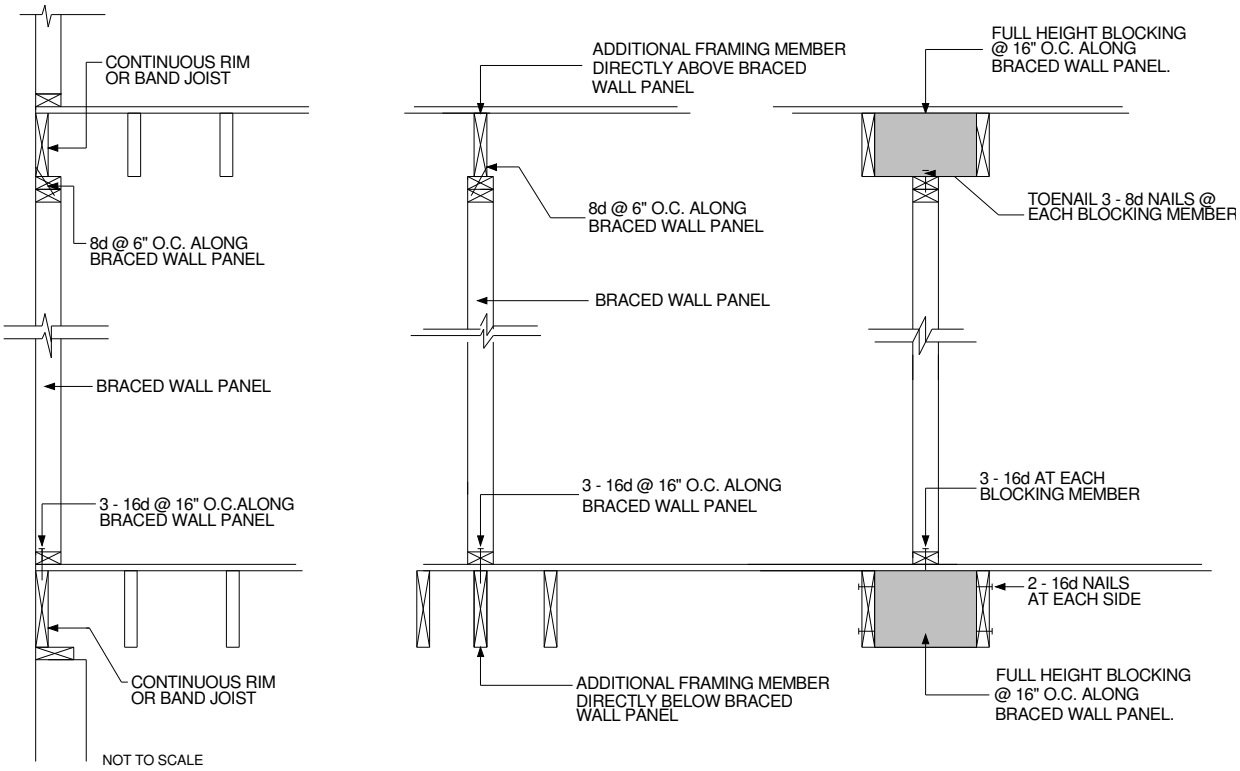


FIGURE R602.10.8(2)
BRACED WALL PANEL CONNECTION WHEN
PARALLEL TO FLOOR/CEILING FRAMING

R602.10.8.1 Braced wall panel connections for Seismic Design Categories D_0, D_1 and D_2. Braced wall panels shall be fastened to required foundations in accordance with Section R602.11.1, and top plate lap splices shall be face-nailed with at least eight 16d nails on each side of the splice.

R602.10.8.2 Connections to roof framing. Exterior braced wall panels shall be connected to roof framing as follows.

1. Parallel rafters or roof trusses shall be attached to the top plates of braced wall panels in accordance with Table R602.3(1).
2. For Seismic Design Categories A, B, C_1 and C and wind speeds less than 100 mph (45 m/s):
    - 2.1 Where the distance from the top of the rafters or roof trusses and perpendicular top plates is 9.25 inches (235 mm) or less, the rafters or roof trusses shall be connected to the top plates of braced wall panels in accordance with Table R602.3(1) and blocking need not be installed.
    - 2.2 Where the distance from the top of the rafters and perpendicular top plates is between 9.25 inches (235 mm) and 15.25 inches (387 mm) the rafters shall be connected to the top plates of braced wall panels with blocking in accordance with Figure R602.10.8.2(1) and attached in accordance with Table R602.3(1).
    - 2.3 Where the distance from the top of the roof trusses and perpendicular top plates is between 9.25 inches (235 mm) and 15.25 inches (387 mm) the roof trusses shall be connected to the top plates of braced wall panels with blocking in accordance with Table R602.3(1).
3. For Seismic Design Categories D_0, D_1 and D_2 or wind speeds of 100 mph (45 m/s) or greater, where the distance between the top of rafters or roof trusses and perpendicular top plates is 15.25 inches (387 mm) or less, rafters or roof trusses shall be connected to the top plates of braced wall panels with blocking in accordance with Figure R602.10.8.2(1) and attached in accordance with Table R602.3(1).
4. For all Seismic Design Categories and wind speeds, where the distance between the top of rafters or roof trusses and perpendicular top plates exceeds 15.25 inches (387 mm),

perpendicular rafters or roof trusses shall be connected to the top plates of braced wall panels in accordance with one of the following methods

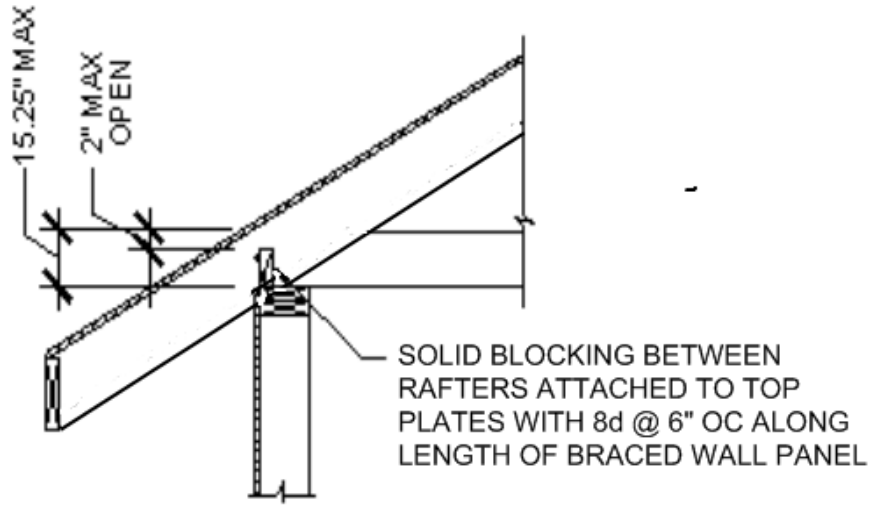
4.1 In accordance with Figure R602.10.8.2(2),

4.2 In accordance with Figure R602.10.8.2(3),

4.3 With full height engineered blocking panels designed for values listed in American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM). Both the roof and floor sheathing shall be attached to the blocking panels in accordance with Table R602.3(1).

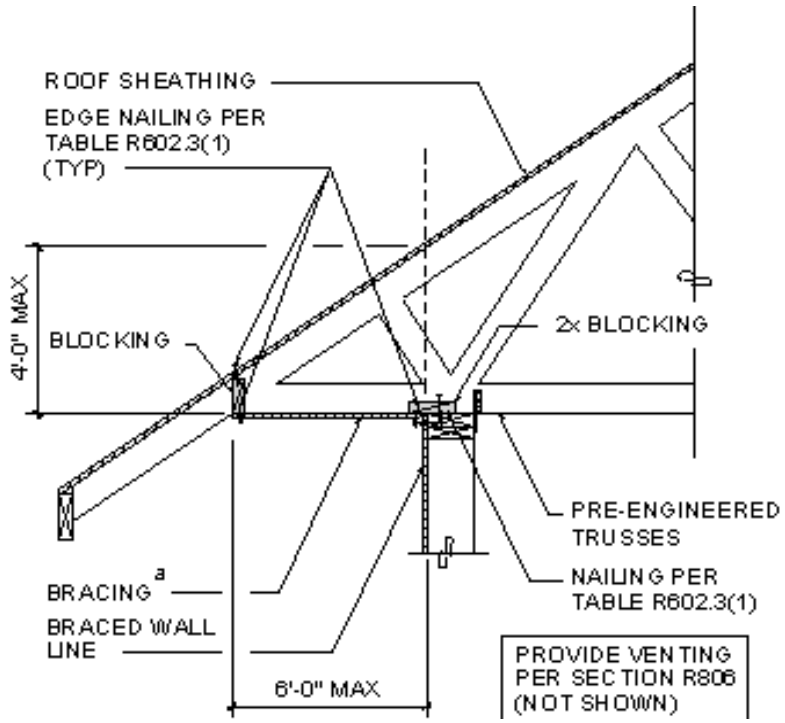
4.4 Designed in accordance with accepted engineering methods.

5. Lateral support for the rafters and ceiling joists shall be provided in accordance with Section R802.8.
6. Lateral support for trusses shall be provided in accordance with Section R802.10.3.



For SI: 1 inch = 25.4 mm

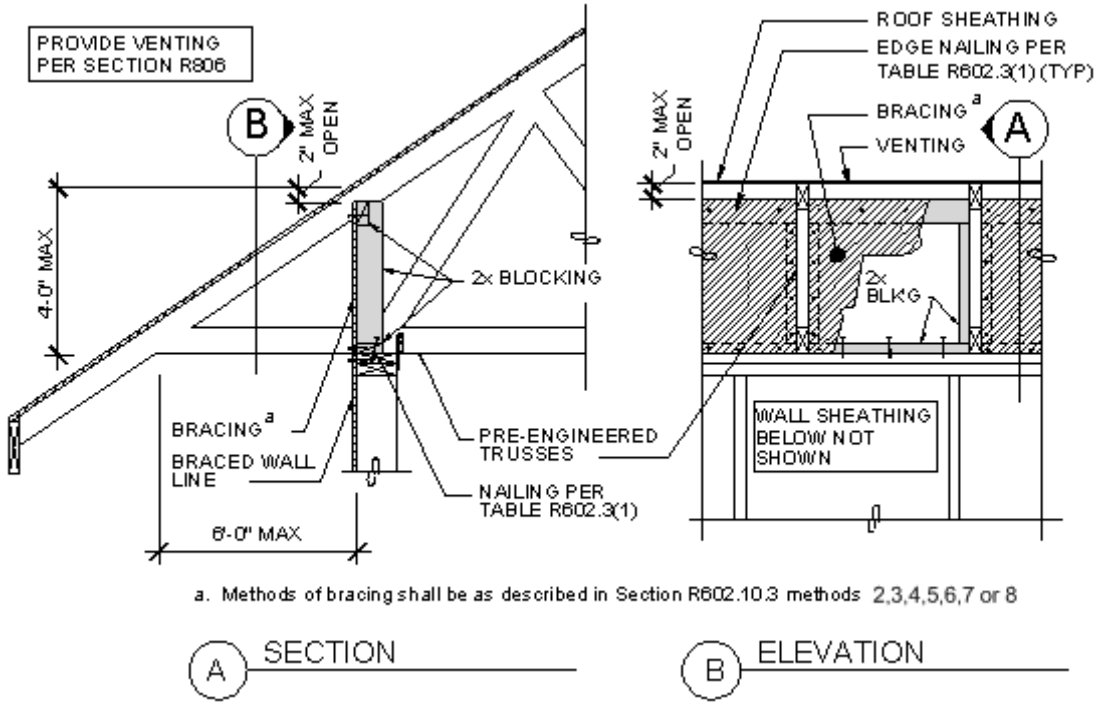
FIGURE R602.10.8.2(1)
BRACED WALL PANEL CONNECTION TO PERPENDICULAR RAFTERS



For SI: 1 inch = 25.4 mm

a. Methods of bracing shall be as described in Section R602.10.2 method DWB, WSP, SFB, GB, PBS, PCP OR HPS
b. Provide ventilation (not shown) per Section R806.

FIGURE R602.10.8.2(2)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES



For SI: 1 inch = 25.4 mm
a. Methods of bracing shall be as described in Section R602.10.2 method DWB, WSP, SFB, GB, PBS, PCP OR HPS
b. Provide ventilation (not shown) per Section R608.

FIGURE R602.10.8.2(3)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

R602.10.9 Braced wall panel support. Braced wall panel support shall be provided as follows:

1. Cantilevered floor joists complying with Section R502.3.3 shall be permitted to support braced wall panels.
2. Elevated post or pier foundations supporting braced wall panels shall be designed in accordance with accepted engineering practice.
3. Masonry stem walls with a length of 48 inches (1220 mm) or less supporting braced wall panels shall be reinforced in accordance with Figure R602.10.9. Masonry stem walls with a length greater than 48 inches (1220 mm) supporting braced wall panels shall be constructed in accordance with Section R403.1 Methods ABW and PFH shall not be permitted to attach to masonry stem walls.
4. Concrete stem walls with a length of 48" or less, greater than 12 inches tall and less than 6 inches thick shall have reinforcement sized and located in accordance with Figure R602.10.9.

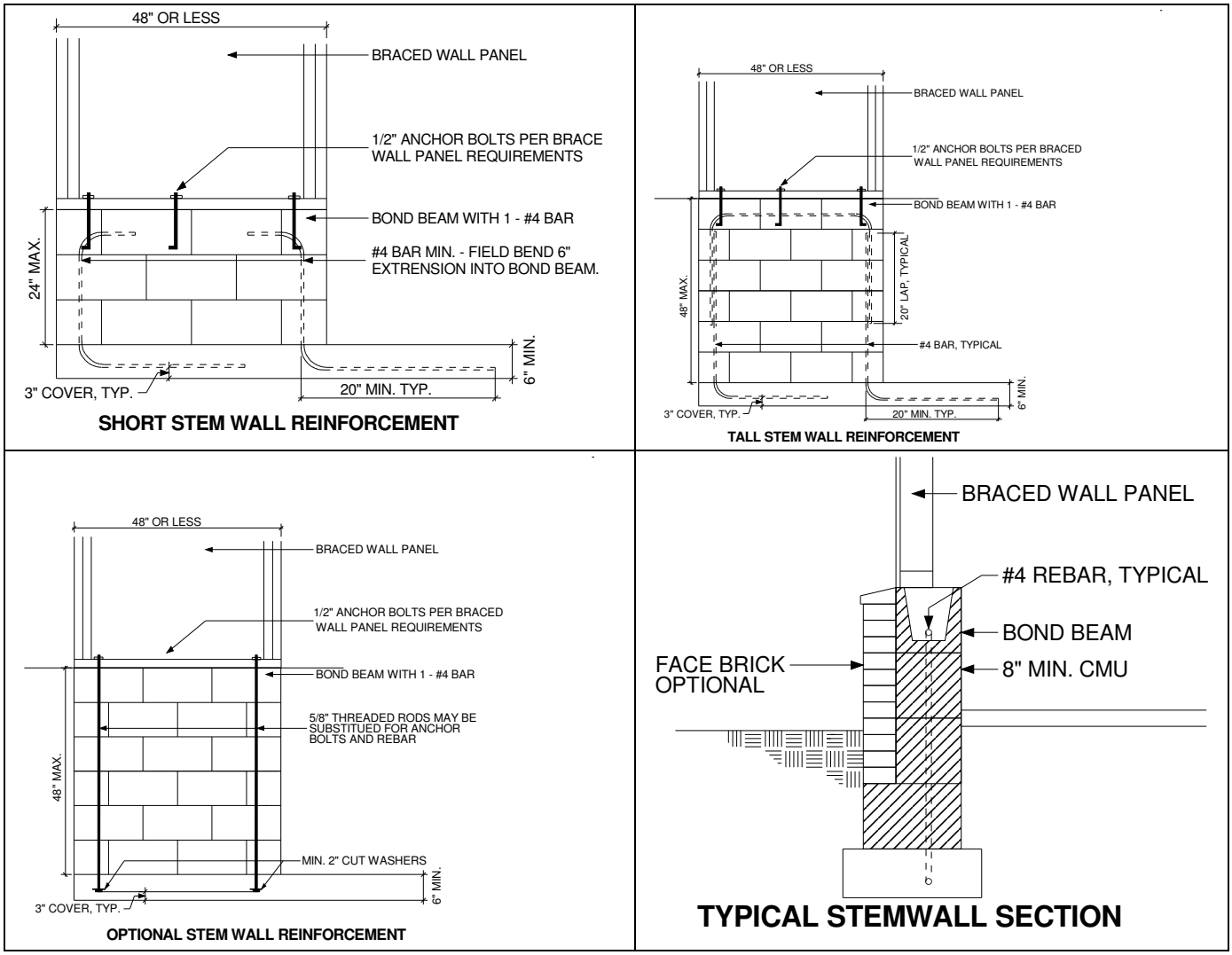


FIGURE R602.10.9
MASONRY STEM WALLS SUPPORTING BRACED WALL PANELS

R602.10.9.1 Braced wall panel support for Seismic Design Category D_2. In one-story buildings located in Seismic Design Category D_2, braced wall panels 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_2, all braced wall panels shall be supported on continuous foundations.

Exception: Two-story buildings shall be permitted to have interior braced wall panels 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 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 1-1/2 inch (38 mm) thickness.

Exceptions:

1. Blocking at horizontal joints shall not be required in wall segments that are not counted as braced wall panels.
2. Where the length of bracing provided is at least twice the required length of bracing from Tables R602.10.3(1) and R602.10.3(3) blocking at horizontal joints shall not be required in braced wall panels constructed using Methods WSP, SFB, GB, PBS or HPS.
3. When Method GB panels are installed horizontally, blocking of horizontal joints is not required.

R602.10.11 Cripple wall bracing. In Seismic Design Categories other than D_2, cripple walls shall be braced with a length and type of bracing as required for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3) with the following modifications for cripple wall bracing:

1. The length of bracing as determined from Tables R602.10.3(1) and R602.10.3(3) shall be multiplied by a factor of 1.15, and
2. The distance between adjacent edges of braced wall panels shall be reduced from 20 feet (6096 mm) to 14 feet (4267 mm).

R602.10.11.1 Cripple wall bracing in Seismic Design Categories D_0, D_1 and D_2. In addition to the requirements of Section R602.10.11, where braced wall lines at interior walls occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.3(3). Where cripple walls braced using Method WSP cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

In Seismic Design Category D_2, cripple walls shall be braced in accordance with Tables R602.10.3(3) and R602.10.3(4).

R602.10.11.2 Redesignation of cripple walls. In any Seismic Design Category, cripple walls shall be permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.