UDC Wall Bracing Provisions quiz 180

Instructions

1. Print these pages. **Fee $60**
2. Answer the **Simple questions** that follow mini sections.
3. Circle the correct answers and transfer the answers to the answer sheets (see pages 44-46).
4. After answering the simple questions you will become familiar with the new code changes.
5. Page down to the last 3 pages for the verification form, answer sheets and mailing instructions.
6. Optional: Watch this video http://www.youtube.com/watch?v=MHaPb1ieAHo

6 hour course for: **Course #15751**

1. Dwelling Contractor Qualifier Certification.
2. UDC Construction Inspector.

Questions call 920-381-6714 or email tmklinka@hotmail.com

UDC Wall Bracing Provisions
Emergency Rules tentative effective date 4/1/2014
A 'How To' guide for use of the new provisions

Summary: Forget what you knew about the previous wall bracing provisions- this method is a different concept. The provisions are generally based on the 2012 IRC Simplified Wall Bracing Provisions. In a nut shell, the new prescriptive Tables provide, depending on the method used, intermittent braced wall panels or continuously sheathed, the number of braced wall panels required in a braced wall line OR the prescriptive total length of braced wall required in wood frame walls parallel to the wind direction being considered.

What hasn't changed? Generally the bracing materials and fastening in Table 321.25-G (with the exception of Portland Cement Plaster as a newly allowed bracing material) remain unchanged.

Major Assumptions:

- Interior side of exterior walls are sheathed with ½" gypsum board.
- 10' wall heights
- Wind Exposure category B
- For intermittent bracing method roof eave to ridge height is 10'

1. The tables depend on the_____ method(s) used, which defines the number of braced wall panels required in a braced wall line OR the prescriptive total length of braced wall required in wood frame walls parallel to the wind direction being considered.
   a. optional bracing concept
   b. intermittent braced
   c. continuously sheathed
   d. both b & c
2. Major Assumptions: Interior side of exterior walls are sheathed with ___" gypsum board.
   a. 3/8
   b. 1/2
   c. 1/4
   d. none of the above
3. The provisions are generally based on the 2014 UDC Simplified Wall Bracing Provisions.
   a. true
   b. false
4. Major assumptions: ____ wall heights.

a. 8’
b. 9’
c. 10’
d. 12’

5. Major Assumptions: Wind Exposure category ____
a. A
b. B
c. C
d. all of the above

6. Major Assumptions: For intermittent bracing method roof eave to ridge height is ___'
a. 8’
b. 9’
c. 10’
d. 12’

Starting with the topmost story ...

STEP 1: Define the braced wall locations by circumscribing the outermost extents of the building at each floor level with a rectangle. The maximum length of any side of the rectangle is 75' for intermittent bracing and 80' for continuously sheathed bracing. For either method the maximum length to width ratio is 3: 1. If the length of the building exceeds the prescriptive limit of the respective table or the length to width ratio exceeds 3: 1 the building must be circumscribed or divided with more than one rectangle. See examples below from the rules -Figure 321.25-B.

7. The maximum length of any side of the rectangle is ____ for intermittent bracing.
a. 70’
b. 75’
c. 80’
d. any of the above

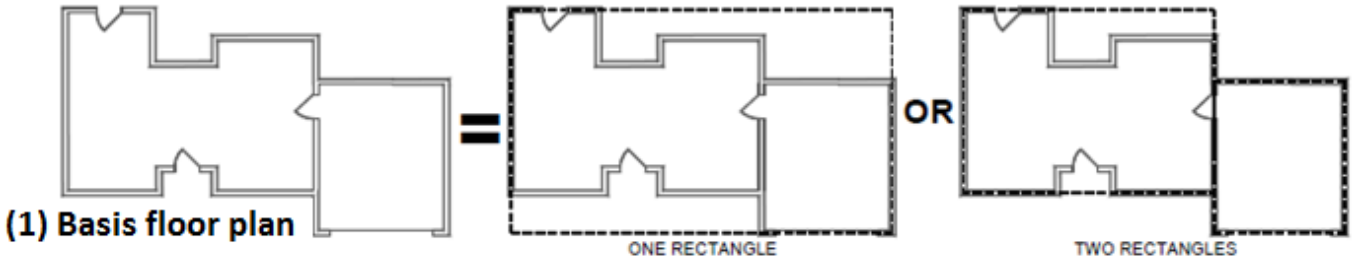
8. The maximum length of any side of the rectangle is ____ for continuously sheathed bracing.
a. 70’
b. 75’
c. 80’
d. none of the above

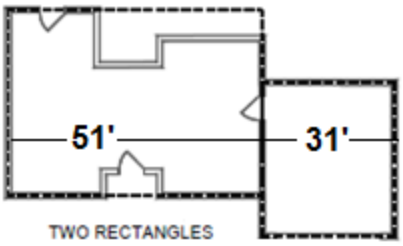
9. For either of the above methods the maximum length to width ratio is _____.
a. 1: 1
b. 2: 1
c. 3: 1
d. 4: 1

10. If the length of the building exceeds the prescriptive limit of the respective table or the length to width ratio the building must be circumscribed or divided with more than one _____.
a. area
b. circle
c. rectangle
d. all of the above

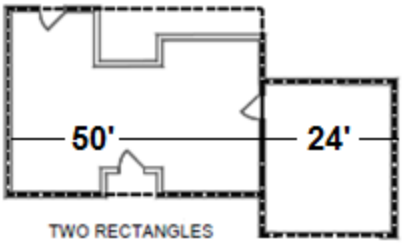
11. Define the braced wall locations by circumscribing the outermost extents of the building at each _____ with a rectangle.
a. wall area
b. building area
c. floor level
d. none of the above

Figure 321.25–B
DEFINING BUILDING SIDES AND LENGTHS WITH A CIRCUMSCRIBED RECTANGLE[a,b,c]

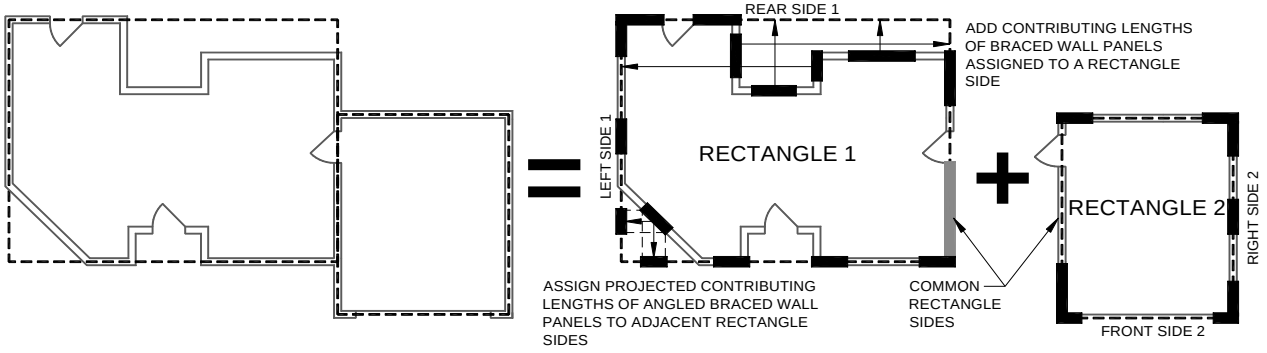


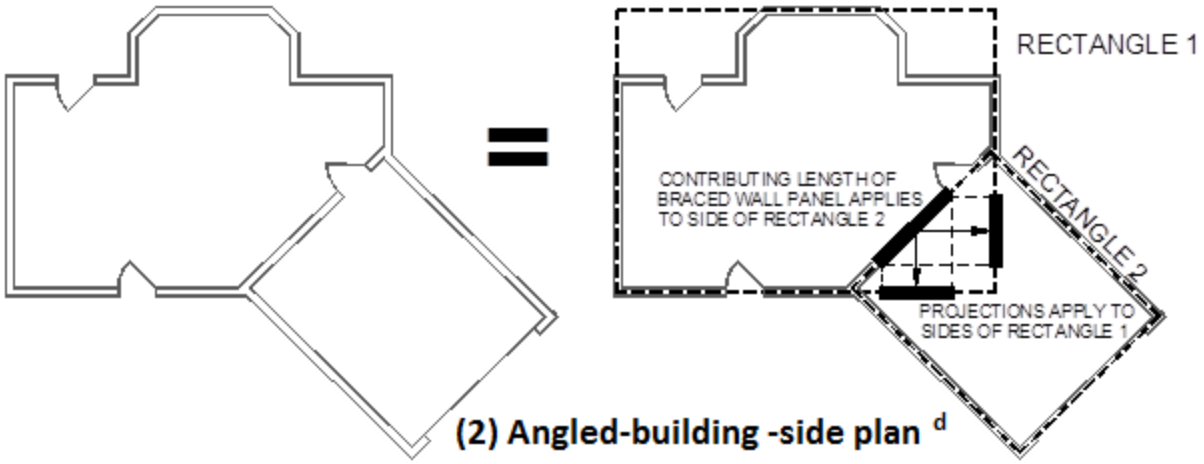


12. The above diagram is required to be divided into two rectangles because _____.
    a. the buildings length of any side of the rectangle exceeds 75’ for intermittent bracing
    b. the buildings length of any side of the rectangle exceeds 80’ for continuously sheathed bracing
    c. the buildings length of any side of the rectangle exceeds 80’ for intermittent bracing
    d. both a & b



13. The above diagram is not required to be divided into two rectangles because _____.
    a. the buildings length of any side of the rectangle is less than 75’ for intermittent bracing
    b. the buildings length of any side of the rectangle is less than 80’ for continuously sheathed bracing
    c. the buildings length of any side of the rectangle is less than 80’ for intermittent bracing
    d. both a & b





(2) Angled-building -side plan [d]

a. Each floor plan level shall be circumscribed with one or more rectangles around the entire floor plan at the floor level under consideration as shown. When multiple rectangles are used, each side shall be braced as though it were a separate building and the bracing amount added together along the common wall where adjacent rectangles overlap or abut.
b. Rectangles shall surround all enclosed plan offsets and projections. **Chimneys**, partial height projections, and open structures, such as carports and decks, **shall be excluded** from the rectangle.
c. Each rectangle shall have a maximum rectangle length-to-width ratio of 3:1.
d. Projected contributing lengths of angled braced wall panels shall be assigned to the closest rectangle sides, as shown for the angled corner in the angled-building-side-plan shown above.
e. Braced wall panels located on a common wall where angled rectangles intersect, as shown in Figure 321.25-B(3), shall have their contributing length applied towards the required length of bracing for the parallel rectangle side and its projected contributing lengths towards the adjacent angled rectangle sides. Where the common side of rectangle 2 as shown in Figure 321.25-B(3) has no physical wall, the portion shall be designed in accordance with s. SPS 321.25 (8) (a).

14. When multiple rectangles are used, each side shall be braced as though it were _____ building.
    a. the same
    b. part of the
    c. a separate
    d. none of the above
15. When multiple rectangles are used, each side shall have the bracing amount added together along the common wall where adjacent rectangles _____.
    a. connect
    b. touch
    c. overlap
    d. none of the above
16. Rectangles shall surround all enclosed plan _____.
    a. offsets
    b. carports
    c. decks
    d. both a & b
17. Chimneys, partial height projections, and open structures, such as carports and decks, shall be _____ from the rectangle.
    a. included
    b. excluded
    c. independent
    d both a or b

18. Each rectangle shall have a _____ rectangle length-to-width ratio of 3:1.
    a. minimum
    b. maximum
    c. both a or b
    d. none of the above
19. Chimneys shall be included from the rectangle.
    a. true
    b. false

STEP 2: Select the wall bracing method (intermittent or continuous), materials, and panel width from Table 321.25-G. If using intermittent braced wall panels, in general most of the bracing methods are considered equivalent and the method simply tells you the NUMBER of panels required in a braced wall line. For continuously sheathed braced walls the method yields the total LENGTH of braced wall required in each braced wall line.

20. For continuously sheathed braced walls the method yields the total _____ of braced wall required in each braced wall line.
    a. number
    b. length
    c. both a or b
    d none of the above
21. If using intermittent braced wall panels, in general most of the bracing methods are considered equivalent and the method simply tells you the _____ of panels required in a braced wall line.
    a. number
    b. length
    c. both a or b
    d none of the above
22. If using intermittent braced wall panels, in general _____ of the bracing methods are considered equivalent.
    a. all
    b. most
    c. none
    d. none of the above

SPS 321.25 (8) (b) *Bracing materials and methods.* Wall bracing shall use the materials and methods listed in Table 321.25–G or approved alternatives capable of providing the required wind load resistance as determined in accordance with SPS 321.02 (1) (c). Alternative bracing methods that are an approved as equivalent to one of the bracing methods listed in Table 321.25–G shall be permitted to use the requirements for that bracing method contained herein.

23. Alternative bracing methods that are approved as equivalent to one of the bracing methods listed in _____ shall be permitted to use the requirements for that bracing method contained herein.
    a. Table 321.25–H
    b. Table 321.25–G
    c. Table 321.25–I
    d. Table 321.25–J
24. The required wind load resistance is determined in accordance with _____.
    a. the local authorities
    b. the highest recorded wind loads
    c. SPS 321.02 (1) (c)
    d. all of the above

Table 321.25–G
BRACING METHODS[a]

Method	Minimum Brace Material Thickness or Size	Maximum Nominal Wall Height[b]	Minimum Braced Wall Panel Width or Brace Angle	Connection Criteria	
				Minimum Fasteners	Maximum Spacing
Intermittent Bracing Methods					
LIB[c] Let-in bracing	1x4 wood brace (or approved metal brace installed per manufacturer instructions)	10'	45° angle and maximum 16" o.c. stud spacing[b]	2-8d common nails or 3-8d box nails (2-1/2" long x 0.113" diameter)	Per stud and top and bottom plates[e]
DWB Diagonal wood boards	¾" (1" nominal) for maximum 24" o.c. stud spacing	10'	48"	2-8d box nails (2-1/2" long x 0.113" diameter) or 2 – 1-3/4" long 16 gage staples	Per stud and top and bottom plates[e]
WSP Wood structural panel	3/8" for maximum 16"o.c. stud spacing; 7/16" for maximum 24" o.c. stud spacing	10'	48"	6d common nail or 8d box nail (2-1/2" long x 0.113" diameter) or 7/16" crown 16 gage staples, 1-1/4" long	6" edges, 12" field (nails) 3" edges, 6" field (staples)
SFB Structural fiberboard sheathing	½" for maximum 16" o.c. stud spacing	10'	48"	1-1/2" long x 0.120" diameter galvanized roofing nails or 1" crown 16 gage staples, 1-1/4" long	3" edges, 6" field
GB Gypsum board (installed on both sides of wall)	½" for maximum 24" o.c. stud spacing	10'	96"	5d cooler nails, or #6 screws	7" edges, 7" field (including top and bottom plates)
PCP Portland cement plaster	¾" for maximum 16" o.c. stud spacing	10'	48"	1-1/2" long, 11 gage, 7/16" diameter head nails or 7/8" long, 16 gage staples	6" o.c. on all framing members
Continuous Sheathed Bracing Methods					
CS-WSP[d] Continuous sheathed WSP	3/8" for maximum 16"o.c. stud spacing; 7/16" for maximum 24" o.c. stud spacing	12'	Refer to Table 321.25-H	Same as WSP	Same as WSP
CS-SFB[d] Continuous sheathed SFB	½" for maximum 16" o.c. stud spacing			Same as SFB	Same as SFB
Narrow Panel Bracing					
PF Portal frame	7/16"	12'	Refer to Figure 321.25–A	Refer to Figure 321.25–A	Refer to Figure 321.25–A

a. The interior side of all exterior walls shall be sheathed with minimum ½" gypsum wall board. All edges of panel-type wall bracing, except horizontal joints in GB bracing, shall be attached to framing or blocking.
b. The actual measured wall height shall include stud height and thickness of top and bottom plates. The actual wall height shall be permitted to exceed the listed nominal values by not more than 4 inches. Tabulated bracing amounts in s. SPS 321.25 (8) (c) are based on a 10-foot nominal wall height for all bracing methods and shall be permitted to be adjusted to other nominal wall heights not exceeding 12 feet in accordance with footnotes to Table 321.25–I or Table 321.25–J.
c. LIB is not be permitted for walls supporting a roof and two floors. Two LIB braces installed at a 60 degree angle from horizontal shall be permitted to be substituted for each 45 degree angle LIB brace.
d. Bracing with CS-WSP and CS-SFB shall have sheathing installed on all sheathable surfaces above, below, and between wall openings.
e. Shall be attached to the top and bottom plates and any intermediate studs, in one continuous length.
f. Each braced panel may contain no more than one hole, having a maximum dimension of no more than ten percent of the least dimension of the panel, and confined to the middle three-fourths of the panel.

25. **e**. Shall be attached to the top and bottom plates and any intermediate studs, in one continuous length is required for _____.
    a. LIB
    b. DWB
    c. GB
    d. both a & b
26. Method LIB may be permitted for walls supporting a roof and one floor.
    a. true
    b. false
27. Minimum fastener size for a CS-WSP would be _____.
    a. 6d common nail
    b. 8d box nail
    c. same as WSP
    d. all of the above
28. Maximum fastener spacing for a CS-WSP would be _____.
    a. 6" edges, 12" field (nails)
    b. 3" edges, 6" field (staples)
    c. same as WSP
    d. all of the above
29. Maximum nominal wall height for LIB would be _____'.
    a. 10
    b. 12
    c. none of the above
    d. both a & b
30. **a**. The interior side of all exterior walls shall be sheathed minimum ½" gypsum wall board. All edges of panel-type wall bracing, except horizontal joints in GB bracing, shall be attached to framing or blocking is required for all BRACING METHODS.
    a. true
    b. false
31. **b**. The actual measured wall height shall include stud height and thickness of top and bottom plates. The actual wall height shall be permitted to exceed the listed nominal values by not more than ___ inches.
    a. 1
    b. 2
    c. 3
    d. 4

32. Tabulated bracing amounts in s. SPS 321.25 (8) (c) are based on a ___ foot nominal wall height for all bracing methods.
    a. 8
    b. 9
    c. 10
    d. 12
33. Tabulated bracing amounts in s. SPS 321.25 (8) (c) shall be permitted to be adjusted to other nominal wall heights not exceeding ___ feet in accordance with footnotes to Table 321.25–I or Table 321.25–J.
    a. 8
    b. 9
    c. 10
    d. 12
34. **c.** ____ LIB braces installed at a 60 degree angle from horizontal shall be permitted to be substituted for each 45 degree angle LIB brace.
    a. one
    b. two
    c. three
    d. none of the above
35. Bracing methods _____ shall have sheathing installed on all sheathable surfaces above, below, and between wall openings.
    a. CS-WSP
    b. CS-SFB
    c. none of the above
    d. both a & b
36. Braced wall panel width for GB would be _____.
    a. 48”
    b. 96”
    c. c. refer to table 321.25-H
    d. either a or b
37. Braced wall panel method for GB would be _____.
    a. installed on one side
    b. installed on both sides
    c. reduced to 50% if installed on both sides
    d. both a & c
38. Minimum thickness bracing material for CS-WSP 16” o.c. would be?
    a. ¼”
    b. 3/8”
    c. 7/16”
    d. ½”
39. Minimum thickness bracing material for CS-SFB 16” o.c. would be?
    a. ¼”
    b. 3/8”
    c. 7/16”
    d. ½”
40. Maximum nominal wall height for CS-WSP would be?
    a. 8
    b. 9
    c. 10
    d. 12
41 Minimum brace wall panel width for CS-WSP would be?

a. 48”
b. 96”
c. refer to table 321.25-H
d. all of the above

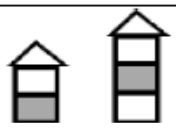
STEP 3: DETERMINE# OF PANELS OR REQUIRED LENGTH OF BRACING USING ONE OF THE FOLLOWING

A) Intermittent braced wall panels. Determine the NUMBER of braced panels in each braced wall line (rectangle side) using Table 321.25-1 based on the length of the perpendicular side. NOTE a minimum of 2 braced wall panels is required in each braced wall line.

42. A minimum of ___ braced wall panels is required in each braced wall line.
a. 1
b. 2
c. 3
d. 4

43. Intermittent braced wall panels. Determine the NUMBER of braced panels in each braced wall line (rectangle side) using Table 321.25-1 based on the length of the _____ side.
a. adjacent
b. parallel
c. perpendicular
d. farthest

Table 321.25–I
REQUIRED NUMBER OF INTERMITTENT BRACED WALL PANELS ON WALLS PARALLEL TO EACH RECTANGLE SIDE AT EACH FLOOR LEVEL[a,b,c,d,e,f,g,h]

Wall Supporting:		Required Number of Brace Panels on a Building Side — Length of Perpendicular Side (feet) ≤25’	50’	75’
Roof and ceiling only		1[i]	2	3
One floor, roof and ceiling		2	4	6
Two floors, roof and ceiling		3	6	9

a. Interpolation is permitted. Extrapolation is prohibited.
b. This table applies to wind exposure category B. For wind exposure category C or D, multiply the number of braced wall panels required by 1.3 or 1.6, respectively.

Wind exposure category B is comprised of urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. Exposure B shall be assumed unless the site meets the definition of another type exposure.

Wind exposure category C is comprised of flat, open country and grasslands with scattered obstructions, including surface undulations or other irregularities, having heights generally less than 30 feet extending more than 1,500 feet from the building site in any quadrant. This exposure also applies to any building

located within Exposure B type terrain where the building is directly adjacent to open areas of Exposure C type terrain in any quadrant for a distance of more than 600 feet.

Wind exposure category D is comprised of flat, unobstructed areas exposed to wind flowing over open water for a distance of at least 1 mile. This exposure applies only to those buildings and other structures exposed to the wind coming from over the water. Exposure D extends inland from the shoreline a distance of 1,500 feet or 10 times the height of the building or structure, whichever is greater.

c. Tabulated values are based on a nominal wall height of 10 feet. For nominal wall heights other than 10 feet and not more than 12 feet, multiply the required number of brace panels by the following factors: 0.9 for 8 feet, 0.95 for 9 feet, 1.15 for 11 feet, or 1.3 for 12 feet.

d. Tabulated values are based on a roof with a top-of-wall-to-ridge height of 10 feet. For roof top-of-wall-to-ridge heights other than 10 feet, multiply the required number of brace panels by the following factors for each floor level support condition:

Roof only – 0.7 for 5 feet, 1.3 for 15 feet, or 1.6 for 20 feet
Roof + 1 Floor – 0.85 for 5 feet, 1.15 for 15 feet, or 1.3 for 20 feet
Roof + 2 Floors – 0.9 for 5 feet or 1.1 for 15 feet.

e. Where minimum ½" gypsum wall board is not included on the interior side of the wall, multiply the number of braced wall panels by 1.7 for LIB bracing or 1.4 for all other bracing methods, except this increase is not required for the portal frame method.

f. Adjustments in footnotes b to e apply cumulatively. Fractions of panels shall be rounded to the nearest one-half braced wall panel.

g. Perpendicular sides to the front and rear sides are the left and right sides. Perpendicular sides to the left and right sides are the front and rear sides. See Figure 321.25–B.

h. The following braced wall panel conditions shall be permitted to be counted as one-half a braced wall panel toward meeting the required number of panels: (1) one 60 degree LIB; (2) one 48" GB or one 96" GB with gypsum wall board on one side; (3) one 36" WSP or SFB braced wall panel for wall heights not more than 9 feet; (4) a 48" WSP or SFB braced wall panel where there is no more than one unblocked horizontal joint; or (5) one PF brace panel complying with Figure 321.25–A.

i. This value of less than 2 serves only as the beginning value for calculation purposes. The resulting value shall be 2 or greater, to be consistent with subd. 2.

44. All of the footnotes (a-i) below Table 321.25-I are applicable.
    a. true
    b. false

45. The required number of intermittent braced wall panels on exterior walls parallel to each rectangle side with a roof and ceiling only would be _____ with a length of 24' on the perpendicular side.
    a. 6
    b. 2
    c. 3
    d. 4

46. The required number of intermittent braced wall panels on exterior walls parallel to each rectangle side with a roof and ceiling only would be _____ with a length of 26' on the perpendicular side.
    a. 6
    b. 2
    c. 3
    d. 4

47. The required number of intermittent braced wall panels on exterior walls parallel to each rectangle side with two floors, roof and ceiling would be _____ with a length of 49' on the perpendicular side.
    a. 6
    b. 2
    c. 3
    d. 4

48. The required number of intermittent braced wall panels on exterior walls parallel to each rectangle side with two floors, roof and ceiling would be _____ with a length of 25' on the perpendicular side.
    a. 6
    b. 2
    c. 3
    d. 4
49. Interpolation and extrapolation is permitted.
    a. true
    b. false
50. Table applies to wind exposure category B. For wind exposure category ____, multiply number of braced wall panels required by 1.3 or 1.6, respectively.
    a. B
    b. C
    c. D
    d. both C or D
51. Wind exposure category ___ is comprised of urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. This exposure shall be assumed unless the site meets the definition of another type exposure.
    a. B
    b. C
    c. D
    d. both C or D
52. Wind exposure category ____ is comprised of flat, open country and grasslands with scattered obstructions, including surface undulations or other irregularities, having heights generally less than 30 feet extending more than 1,500 feet from the building site in any quadrant. This exposure also applies to any building located within Exposure B type terrain where the building is directly adjacent to open areas of Exposure C type terrain in any quadrant for a distance of more than 600 feet.
    a. B
    b. C
    c. D
    d. both C or D
53. Wind exposure category ___ is comprised of flat, unobstructed areas exposed to wind flowing over open water for a distance of at least 1 mile. This exposure applies only to those buildings and other structures exposed to the wind coming from over the water.
    a. B
    b. C
    c. D
    d. both C or D
54. Exposure ___ extends inland from the shoreline a distance of 1,500 feet or 10 times the height of the building or structure, whichever is greater.
    a. B
    b. C
    c. D
    d. both C or D
55. Tabulated values are based on a nominal wall height of ___ feet.
    a. 8
    b. 9
    c. 10
    d. 12

56. For nominal wall heights other than 10 feet and not more than 12 feet, multiply the required number of brace panels by the following factors:
    a. 0.8 for 8 feet
    b. 0.95 for 9 feet
    c. 1.10 for 10 feet
    d. none of the above
57. For nominal wall heights other than 10 feet and not more than 12 feet, multiply the required number of brace panels by the following factors:
    a. 1.15 for 11 feet
    b. 1.3 for 12 feet
    c. 1.5 for 13 feet
    d. both a & b
58. Tabulated values are based on a with a top-of-wall-to-ridge height of feet of __ feet.
    a. 8
    b. 9
    c. 10
    d. 12
59. For top-of-wall-to-ridge height other than 10 feet_____ the required number of brace panels by the following factors for each floor level support condition.
    a. divide
    b. add
    c. subtract
    d. multiply
60. The multiplier for Roof + 1 Floor would be _____.
    a. .85 for 5 feet
    b. 1.15 for 15 feet
    c. 1.3 for 20 feet
    d. all of the above
61. Where minimum ½" gypsum wall board is not included on the interior side of the wall, multiply the number of braced wall panels by 1.7 for _____.
    a. WSP
    b. DWB
    c. LIB
    d. GB
62. Where minimum ½" gypsum wall board is not included on the interior side of the wall, multiply the number of braced wall panels by 1.4 for _____.
    a. WSP
    b. DWB
    c. GB
    d. all of the above
63. Adjustments in footnotes b-d apply cumulatively. Fractions of panels shall be rounded to the nearest _____ braced wall panel.
    a. whole
    b. ¼
    c. ½
    d. all of the above
64. The following braced wall panel conditions shall be permitted to be counted as one-half a braced wall panel toward meeting the required number of panels:
    a. one 60 degree DWB
    b. one 48" GB

c. one 96" GB with gypsum wall board on one side
d. only b & c

65. The following braced wall panel conditions shall be permitted to be counted as one-half a braced wall panel toward meeting the required number of panels:
a. one 36" WSP or SFB braced wall panel for wall heights not more than 12 feet
b. 48" WSP or SFB braced wall panel where there is no more than 2 unblocked horizontal joint
c. one PF brace panel complying with Figure 321.25–A
d. all of the above

B) Continuously Sheathed braced walls. Determine the LENGTH of braced wall panels in each braced wall line (rectangle side) using Table 321.25-J based on the length of the perpendicular side.

Table 321.25–J
REQUIRED LENGTH OF CONTINUOUS BRACING ON WALLS PARALLEL TO EACH RECTANGLE SIDE AT EACH FLOOR LEVEL[a,b,c,d, e,g,h]

Top-of-Wall-to-Ridge Height (feet)	Wall Supporting:	Total Required Length (feet) of Full-Height Bracing on Any Side of Rectangle							
		Length of Perpendicular Side (feet)[f]							
		10	20	30	40	50	60	70	80
10	Roof and ceiling only	2.0[i]	3.5[i]	5.0	6.0	7.5	9.0	10.5	12.0
	One floor, roof and ceiling	3.5[i]	6.5	9.0	12.0	14.5	17.0	19.8	22.6
	Two floors, roof and ceiling	5.0	9.5	13.5	17.5	21.5	25.5	29.2	33.4
15	Roof and ceiling only	2.6[i]	4.6	6.5	7.8	9.8	11.7	13.7	15.7
	One floor, roof and ceiling	4.0	7.5	10.4	13.8	16.7	19.6	22.9	26.2
	Two floors, roof and ceiling	5.5	10.5	14.9	19.3	23.7	27.5	32.1	36.7
20	Roof and ceiling only	2.9[i]	5.2	7.3	8.8	11.1	13.2	15.4	17.6
	One floor, roof and ceiling	4.5	8.5	11.8	15.6	18.9	22.1	25.8	29.5
	Two floors, roof and ceiling	6.2	11.9	16.8	21.8	27.3	31.1	36.3	41.5

a. Interpolation is permitted; extrapolation shall be prohibited.
b. Table applies to wind exposure category B. For wind exposure category C or D, multiply the number of braced wall panels required by 1.3 or 1.6, respectively. Wind exposure categories are as defined in Table 321.25–I footnote b.
c. Tabulated values are based on a nominal wall height of 10 feet. For nominal wall heights other than 10 feet, multiply the required length of bracing by the following factors: 0.90 for 8 feet, 0.95 for 9 feet , 1.05 for 11 feet, or 1.10 for 12 feet.
d. Where minimum ½" gypsum wall board interior finish is not provided, the required bracing amount for the affected rectangle side shall be multiplied by 1.4, except this increase is not required for the portal frame method.
e. Adjustments in footnotes b to d apply cumulatively.

f. Perpendicular sides to the front and rear sides are the left and right sides. Perpendicular sides to the left and right sides are the front and rear sides. See Figure 321.25–B.
g. Continuous sheathing shall be applied to all surfaces of the wall, including areas between brace panels and above and below wall openings.
h. When used on a wall line with continuous sheathing, each portal frame panel is counted for its actual length in contributing toward the length of continuous sheathing used on other portions of the same wall line, such as the building side at a given story level.
i. Any value of less than 4.0 in this table serves only as the beginning value for calculation purposes. The resulting value shall be 4.0 or greater, to be consistent with Table 321.25–H and subd. 2.

66. Table applies to wind exposure category __.
    a. B
    b. C
    c. D
    d. both b or c
67. For wind exposure category ___, multiply number of braced wall panels required by 1.3 or 1.6, respectively.
    a. B
    b. C
    c. D
    d. both b or c
68. Tabulated values are based on a nominal wall height of __ feet.
    a. 8
    b. 9
    c. 10
    d. 12
69. For nominal wall heights other than 10 feet, multiply the required length of bracing by the following factors:
    a. 0.90 for 8 feet
    b. 0.95 for 9 feet
    c. 1.05 for 10 feet
    d. both a & b
70. For nominal wall heights other than 10 feet, multiply the required length of bracing by the following factors:
    a. 1.00 for 11 feet
    b. 1.10 for 12 feet
    c. 1.15 for 13 feet
    d. 1.20 for 14 feet
71. Where minimum ½" gypsum wall board interior finish is not provided, the required bracing amount for the affected rectangle side shall be multiplied by_____.
    a. 1.20
    b. 1.30
    c. 1.40
    d. 1.50
72. Perpendicular sides to the front and rear sides are the _____ sides. See Figure 321.25–B
    a. left and right
    b. front and rear
    c. both a & b
    d. none of the above
73. Perpendicular sides to the left and right sides are the _____ sides. See Figure 321.25–B
    a. left and right

b. front and rear
c. both a & b
d. none of the above

74. Eave to ridge height is 10', length of perpendicular side is 30', and the wall is supporting one floor, roof, and ceiling. What is the required length of bracing on any side of rectangle?
a. 5'
b. 6.5'
c. 9'
d. 12'

75. Top-of-wall-to-ridge is 15', length of perpendicular side is 60', and the wall is supporting one floor, roof, and ceiling. What is the required length of bracing on any side of rectangle?
a. 22.9'
b. 16.7'
c. 19.6'
d. 11.7'

STEP 4: If desired or required, apply any adjustment factors (adjustments may decrease or increase the required bracing amount) per the footnotes to the Tables. For example wall heights taller than 10' and wind exposure category C or D would both increase the bracing amount. Absence of interior ½" gypsum board sheathing increases required bracing amount.

76. Wall heights taller than 10' and wind exposure category C or D would both _____the bracing amount.
a. increase
b. decrease
c. complicate
d. all of the above

77. Absence of interior ½" gypsum board sheathing will _____ the required bracing amount.
a. increase
b. decrease
c. complicate
d. all of the above

STEP 5: Repeat steps 2 through 4 considering wind in the perpendicular direction.

STEP 6: Determine the minimum required width of braced wall panels. For intermittent bracing method the minimum length of braced wall panel is given in Table 321.25-G. For continuously sheathed bracing method the minimum width is determined using Table 321.25-H dependent on the maximum opening height adjacent to the panel and the wall height. **PF Method:** For Intermittent bracing, per Table 321.25-1 footnote 'h', each PF panel (16-24" wide per Figure 321.25-A) counts as 1/2 of a braced wall panel when determining compliance with Table 321.25-1. For Continuously Sheathed bracing, the actual length of each PF panel (16-24" wide per Figure 321.15-A) in feet counts toward the required total length of bracing required.

78. For intermittent bracing method the minimum length of braced wall panel is given in Table _____.
a. 321.25-G
b. 321.25-H
c. both a & b
d. none of the above

79. For continuously sheathed bracing method the minimum width is determined using Table _____.
a. 321.25-G

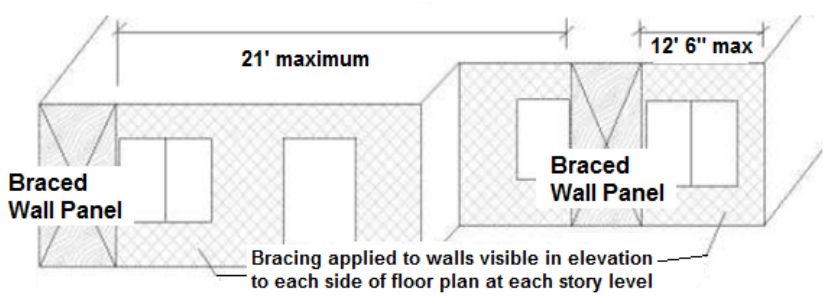
b. 321.25-H
c. both a & b
d. none of the above

80. For Intermittent bracing, per Table 321.25-1 footnote 'h', each PF panel (16-24" wide per Figure 321.25-A) counts as _____of a braced wall panel when determining compliance with Table 321.25-1.
a. ¼
b. 1/3
c. ½
d. feet counts toward the required total length of bracing required

81. For Continuously Sheathed bracing, _____ (16-24" wide per Figure 321.15-A) in feet counts toward the required total length of bracing required.
a. ¼ of a braced wall panel
b. 1/3 of a braced wall panel
c. ½ of a braced wall panel
d. the actual length of each PF panel

STEP 7: Check that location of braced wall panels meets Figure 321.25-C ... start of a panel max 12 1/2' from the building comer and panels spaced maximum of 21' edge to edge along the building side/elevation. For intermittent or continuous methods, each PF panel meeting min. required width of Fig. 321.25-A counts as a braced wall panel when evaluating of Fig. 321.25-C.

FIGURE 321.25-C
LOCATION OF BRACED WALL PANELS ALONG A BUILDING SIDE a



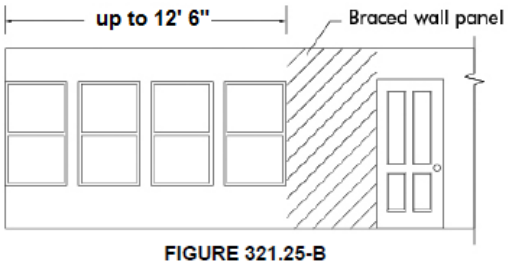


FIGURE 321.25-B
PERMITTED BRACED WALL PANEL DISTANCES
FROM ENDS OF A BRACED WALL LINE

a. A braced wall panel can be anything from one-half to one brace panel.

---

82. Panel maximum is ____ from the building comer.
a. 10’
b. 12 ½’
c. 21’
d. 25’

83. Panels spaced maximum of ____ edge to edge along the building side/elevation.
a. 10’
b. 12 ½’
c. 21’
d. 25’

84. For _____methods, each PF panel meeting min. required width of Fig. 321.25-A counts as a braced wall panel when evaluating of Fig. 321.25-C.
a. intermittent
b. continuous

c. both a & b
d. none of the above

STEP 8: Repeat steps 1 through 7 for additional stories.

Table 321.25–H[a, b]
MINIMUM WIDTHS OF CS-WSP AND CS-SFB BRACED WALL PANELS

Maximum Opening Height Adjacent to Braced Wall Panel	Minimum Length of Full-Height Braced Wall Panel (inches)			
	8' Tall Wall	9' Tall Wall	10' Tall Wall	12' Tall Wall
5'– 4"	24	27	30	36
6'– 8"	32	30	30	36
8'	48	41	38	36
9'	-	54	46	41
10'	-	-	60	48
12'	-	-	-	72

[a] Sheathing shall extend from the top of the top plate to the bottom of the bottom plate and may be multiple sheets. All joints shall be blocked.

[b] Interpolation is permitted.

85. The minimum width of method CS-WSP braced wall panels with a maximum opening height adjacent to brace wall panel of up to 8', with a 9' tall wall, what is the minimum length of the required braced wall panel?

a. 30"
b. 41"
c. 54"
d. 38"

86. The minimum width of method CS-SFB braced wall panels with a maximum opening height adjacent to brace wall panel of up to 8', with a 10' tall wall, what is the minimum length of the required braced wall panel?

a. 30"
b. 41"
c. 54"
d. 38"

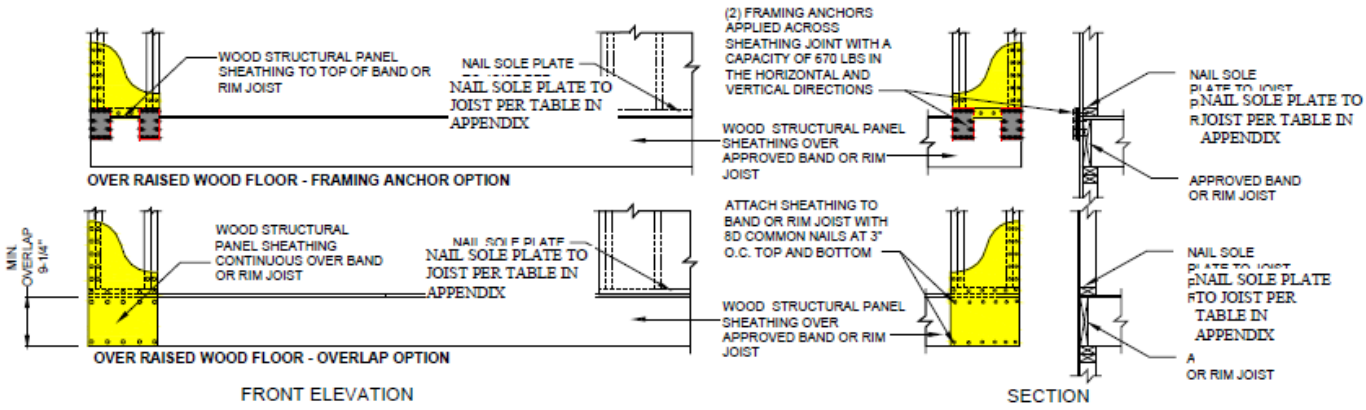
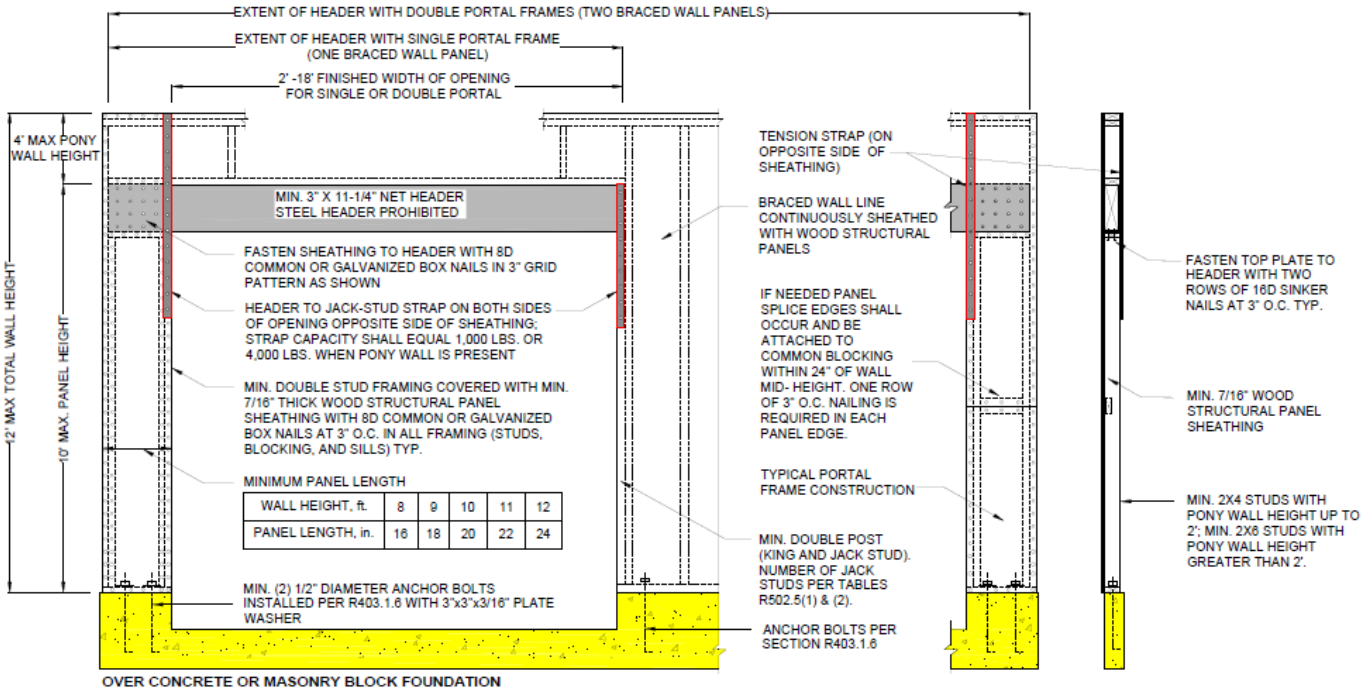


Figure 321.25-A
PF - PORTAL FRAME BRACE CONSTRUCTION



87. EXTENT OF HEADER WITH DOUBLE PORTAL FRAMES equals _____.
    a. one braced wall panel
    b. two braced wall panels
    c. ½ a braced wall panel
    d. none of the above
88. FASTEN SHEATHING TO HEADER WITH 8D COMMON OR GALVANIZED BOX NAILS IN ____ GRID PATTERN AS SHOWN
    a. 2”
    b. 3”
    c. 4”
    d. 6”
89. HEADER TO JACK-STUD STRAP ON BOTH SIDES AT 3" O.C. TYP. OF OPENING OPPOSITE SIDE OF SHEATHING; STRAP CAPACITY SHALL EQUAL _____ LBS.
    a. 500
    b. 1,000
    c. 3000
    d. 4000
90. HEADER TO JACK-STUD STRAP ON BOTH SIDES AT 3" O.C. TYP. OF OPENING OPPOSITE SIDE OF SHEATHING; _____ LBS. WHEN PONY WALL IS PRESENT
    a. 500
    b. 1,000
    c. 3000
    d. 4000
91. Method PF has a wall height of 10’ would require a minimum panel length of ____.
    a. 16”
    b. 18”
    c. 20”
    d. 22”

(c) *Bracing amount.* Bracing methods and materials complying with Table 321.25–G shall be applied to exterior walls in accordance with all of the following requirements:

1. For the purpose of determining bracing amounts, the outermost extents of the building plan at each floor level shall be circumscribed with a rectangle to define the overall length of each building side as shown in Figure 321.25–B.
2. In no case may the amount of bracing be less than two braced wall panels on exterior walls parallel to each rectangle side for each floor level of the building.
3. Where used, the number of intermittent brace panels applied to walls parallel to each rectangle side shall comply with Table 321.25–I.
4. Where used, the total length of continuous sheathed brace panels applied to walls parallel to each building side shall comply with Table 321.25–J.
5. The location of brace panels applied to walls parallel to each building side shall comply with Figure 321.25–C.
6. The interior side of exterior walls shall be sheathed with minimum ½" gypsum board interior finish unless otherwise permitted to be excluded by this subsection.
7. Balloon-frame walls shall have a maximum height of two floors unless constructed in accordance with an approved design. Wall framing shall be continuous from the lowest floor to the wall top plate at the roof. All edges of sheathing shall be supported on and fastened to blocking or framing. Braced wall panels may not be required on the balloon-frame wall portion provided the bracing amount and brace spacing requirement are satisfied for the building side. Where brace panels must be located on the balloon-frame wall portion to satisfy bracing requirements for the building side containing the balloon-frame wall portion, brace wall panels shall extend to the full height of the balloon-frame wall.

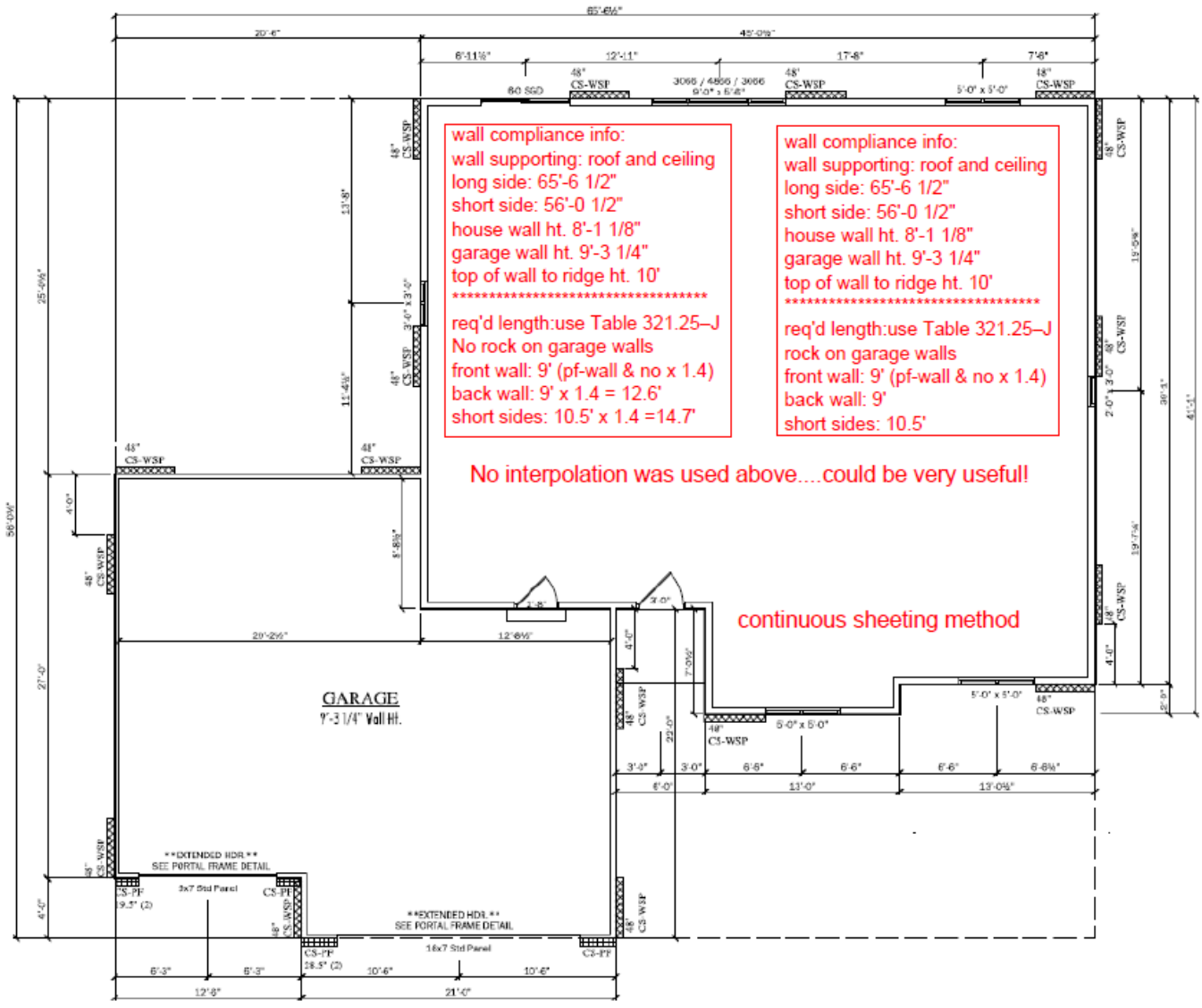
92. Balloon-frame walls shall have a maximum height of ____ floors unless constructed in accordance with an approved design.
    a. 1
    b. 2
    c. 3
    d. 4
93. Balloon-frame walls shall have all edges of sheathing supported on and fastened to _____.
    a. blocking
    b. framing
    c. both a & b
    d. none of the above
94. Where brace panels must be located on the balloon-frame wall portion to satisfy bracing requirements for the building side containing the balloon-frame wall portion, brace wall panels **may** extend to the full height of the balloon-frame wall.
    a. true
    b. false

SECTION 1. SPS 321.02 (1) (c) is amended to read:
SPS 321.02 (1) (c) *Wind loads.* 1. Dwellings shall be designed and constructed to withstand a horizontal and uplift pressure of 20 pounds per square foot acting over the surface area, except wind loads may be determined in accordance with ASCE 7–05, *Minimum Design Loads for Buildings and Other Structures*.
2. No wind load reduction may be permitted for the shielding effect of other buildings.
3. Compliance with the prescriptive construction requirements of this chapter shall be deemed to be compliance with this paragraph.
SECTION 2. SPS 321.23 is amended to read: Walls shall comply with the design requirements of s. SPS 321.02. Compliance with the prescriptive construction requirements of s. SPS 321.25 shall be deemed to be compliance with this section.

95. *Wind loads.* 1. Dwellings shall be designed and constructed to withstand a horizontal and uplift pressure of ___ pounds per square foot acting over the surface area.

a. 10
b. 15
c. 20
d. 25

96. Wind load reduction may be permitted for the shielding effect of other buildings.
a. true
b. false



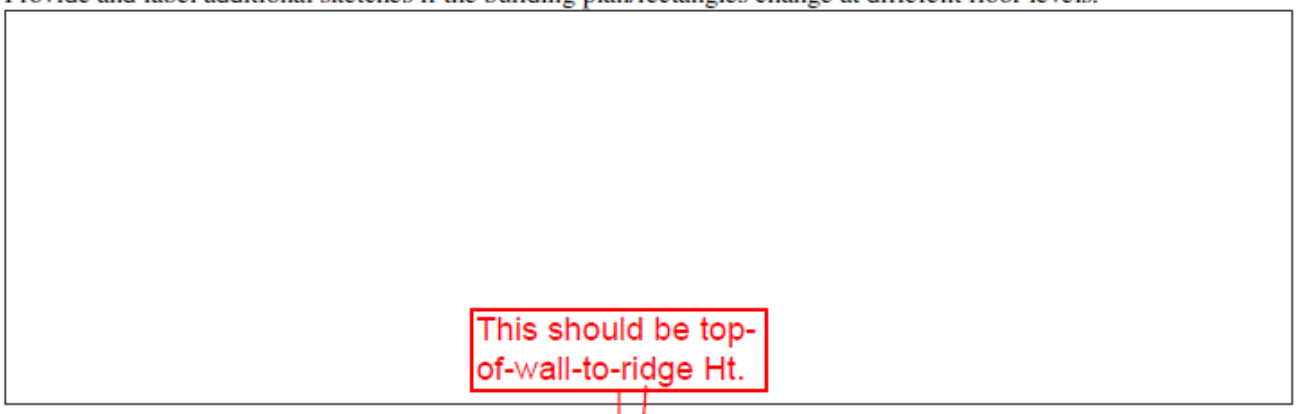
Rectangle 1….Assume exposure category B above <u>with gypsum</u> wall board on garage walls.

<u>Questions 97-110</u> use 10’ for side walls and 10’ eave to ridge for table calculations & **<u>no interpolation.</u>**

Wall Bracing Compliance Worksheet

Complete this worksheet or provide equivalent information on the plans submitted with the permit application.

Sketch and dimension the building plan and the wall bracing rectangle(s) per 321.25(8)(c)1. and Figure 321.25-B. Provide and label additional sketches if the building plan/rectangles change at different floor levels.



Indicate applicable Wall Bracing Method for each level (see Table 321.25-G), each labeled rectangle if more than one [see 321.25(8)(c)], and amount of bracing (# of braced panels or length of braced wall required) per the respective table (provide additional worksheets for additional rectangles as needed):

Rectangle: A Wall Ht. = B Eave to Ridge Ht. = C Max. Opening Ht. = D Wind Exp. = E

Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-I Min. panel width (Table 321.25-G) = L		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-J Min. panel width (Table 321.25-H) = M		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = N	
	Long side	Short side	Long side	Short side	Long side	Short side
Roof and ceiling only	F	G	H	I	J	K
One floor, roof and ceiling	O	P	Q	R	S	T
Two floors, roof and ceiling						

Rectangle:____ Wall Ht. = ____ Eave to Ridge Ht. = ____ Max. Opening Ht. = ____ Wind Exp. = ____

Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-1 Min. panel width (Table 321.25-G) = _____		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-H Min. panel width (Table 321.25-H) = _____		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = _____	
	Long side	Short side	Long side	Short Side	Long side	Short side
Roof and ceiling only						
One floor, roof and ceiling						
Two floors, roof and ceiling						

PF Method: For Intermittent bracing, per Table 321.25-I footnote 'h', each PF panel (16-24" wide per Figure 321.25-A) counts as ½ of a braced wall panel when determining compliance with Table 321.25-I. For Continuously Sheathed bracing, the actual length of each PF panel (16-24" wide per Figure 321.25-A) in feet counts toward the required total length of bracing required. For intermittent or continuous methods, each PF panel meeting min. required width of Fig. 321.25-A counts as a braced wall panel when evaluating panel spacing per Fig. 321.25-C.

Indicate location of required braced wall panels determined above on each rectangle side as required by Figure 321.25-C.

Use the diagrams on page 20 and worksheet on page 21 to answer questions 97-110.

97. The letter A above represents _____.
    a. diagram 1
    b. diagram A
    c. rectangle 1
    d rectangle A
98. The letter B above represents the side wall height of ____.
    a. 8’
    b. 9’
    c. 10’
    d. 11’
99. The letter C above represents the eave to ridge height of ____.
    a. 8’
    b. 9’
    c. 10’
    d. 11’
100. The letter D above represents the maximum open height of ____. (Typically an entrance door)
    a. 5’ 4”
    b. 6’ 8”
    c. 8’
    d. 9’
101. The letter E above represents the wind exposure ____.
    a. A
    b. B
    c. C
    d. D
102. The letter F above represents the number of panels required and that number would be ____.
    a. 1
    b. 2
    c. 3
    d. 4
103. The letter G above represents the number of panels required and that number would be ____.
    a. 1
    b. 2
    c. 3
    d. 4
104. The letter H above represents the minimum panel length required and that number would be ____. Assume gypsum board on garage walls.
    a. 6’
    b. 7.5’
    c. 9’
    d. 10.5’
105. The letter I above represents the minimum panel length required and that number would be ____. Assume gypsum board on garage walls.
    a. 6’
    b. 7.5’
    c. 9’
    d. 10.5’

106. The letter J above represents the number of PF panels and that number would be ____.
    a. 0
    b. 2
    c. 3
    d. 4
107. The letter K above represents the number of PF panels and that number would be ____.
    a. 0
    b. 2
    c. 3
    d. 4
108. The minimum panel width for L would be ____ inches. (Assume WSP)
    a. 32
    b. 48
    c. 60
    d. 96
109. The minimum panel width for M would be ____ inches. (Assume WSP)
    a. 24
    b. 30
    c. 36
    d. 48
110. The minimum PF width for N would be ____ inches. (9'-3 1/4"garage wall height- fig. 325.25-A)
    a. 16
    b. 18
    c. 22
    d. 24

Use page 20 diagram….Assume exposure category B without gypsum board on garage walls.

Questions 111-115 use 10' for side walls and 10' eave to ridge for table calculations & **no interpolation.**

Table 321.25-I footnote e: Where minimum ½" gypsum wallboard is not included on the interior side of the wall, multiply the number of braced wall panels by 1.7 for LIB bracing or 1.4 for all other bracing methods, except this increase in not required for portal frame method.

Table 321.25-J footnote d: Where minimum ½" gypsum wallboard interior finish is not provided, the required bracing amount for the affected rectangle side shall be multiplied by 1.4 (The entire rectangle), except this increase in not required for portal frame method.

111. The letter F from page 21 represents the number of panels required and that number would be ____.
    a. 1
    b. 2
    c. 3
    d. 4.2
112. The letter G from page 21 represents the number of panels required and that number would be ____.
    a. 1
    b. 2
    c. 3
    d. 4.2
113. The letter H from page 21 represents the panel length required and that number would be ____. Assume gypsum board on garage walls.
    a. 6'

b. 7.5’
c. 12.6’
d. 10.5’

114. The letter I from page 21 represents the panel length required and that number would be ___. Assume gypsum board on garage walls.
a. 6’
b. 7.5’
c. 9’
d. 14.7’

115. The letter F from page 21 represents the number of panels required on the long side (front wall) and that wall includes 2 portal framed garage doors. Referencing Table 321.25-I footnote e (intermittent method) how many number of panels would be required for this long side front wall only?
a. 1
b. 2
c. 3
d. 4

Use page 20 diagram….Assume exposure category C without gypsum board on garage walls.

Table 321.25-I footnote b: This table applies to wind exposure category B. For wind exposure category C or D, multiply the number of braced wall panels required by 1.3 or 1.6, respectively.
Table 321.25-I footnote e: Where minimum ½” gypsum wall board is not included on the interior side of the wall, multiply the number of braced wall panels by 1.7 for LIB bracing or 1.4 for all other bracing methods, except this increase in not required for portal frame method.

Table 321.25-J footnote b: Table applies to wind exposure category B. For wind exposure category C or D, multiply the number of braced wall panels required by 1.3 or 1.6, respectively.
Table 321.25-J footnote d: Where minimum ½” gypsum wall board interior finish is not provided, the required bracing amount for the affected rectangle side shall be multiplied by 1.4, except this increase in not required for portal frame method.

Questions 116-120 use 10’ for side walls and 10’ eave to ridge for table calculations & **no interpolation.**

116. The letter F from page 21 represents the number of panels required and that number would be ____. (Number of panels x 1.3 for the exposure C x 1.4 for lack of rock in garage)
a. 1
b. 2
c. 3
d. 5.46

117. The letter G from page 21 represents the number of panels required and that number would be ____. (Number of panels x 1.3 for the exposure C x 1.4 for lack of rock in garage)
a. 1
b. 2
c. 3
d. 5.46

118. The letter H from page 21 represents the minimum panel length required and that number would be ____. (Required length x 1.3 for the exposure C x 1.4 for lack of rock in garage)
a. 6’
b. 7.5’
c. 16.38’
d. 10.5’

119. The letter I from page 21 represents the minimum panel length required and that number would be ____. (Required length x 1.3 for the exposure C x 1.4 for lack of rock in garage)

a. 6’
b. 7.5’
c. 9’
d. 19.11’

120. The letter H from page 21 represents the minimum panel length required on the long side (front wall) and that wall includes 2 portal framed garage doors. Referencing Table 321.25-I footnote e (continuous method). What is the minimum panel length that would be required for this long side front wall only? (Required length x 1.3 for the exposure C & **do not** x 1.4 for lack of rock in garage)

a. 6’
b. 7.5’
c. 9’
d. 11.7’

Table 321.25−A
SIZE, HEIGHT AND SPACING OF WOOD STUDS[a,c] (Partial Table)

	Bearing and Exterior Nonbearing Walls					Interior Nonbearing Walls	
Nominal Stud Size (inches)	**Maximum Laterally Unsupported Stud Height[a] (feet)**	**Maximum Spacing When Supporting Roof and Ceiling Only (inches)**	**Maximum Spacing When Supporting One Floor, Roof and Ceiling (inches)**	**Maximum Spacing When Supporting Two Floors, Roof and Ceiling (inches)**	**Maximum Spacing When Supporting One Floor Only (inches)**	**Maximum Laterally Unsupported Stud Height[a] (feet)**	**Maximum Spacing (inches)**
2x6	12[d]	24	24	16	24	20	24

121. The maximum laterally unsupported stud height for a 2x6 stud on an exterior bearing wall would be ____.

a. 10’
b. 12’
c. 16’
d. 20’

122. The maximum laterally unsupported stud height for a 2x6 stud on an interior nonbearing wall would be ____.

a. 10’
b. 12’
c. 16’
d. 20’

Wall Bracing Compliance Worksheet

Complete this worksheet or provide equivalent information on the plans submitted with the permit application.

Sketch and dimension the building plan and the wall bracing rectangle(s) per 321.25(8)(c)1. and Figure 321.25-B. Provide and label additional sketches if the building plan/rectangles change at different floor levels.

Use this worksheet for the 1-1/2 story questions below.

This will be changing to "top of wall to top of ridge height"

Indicate applicable Wall Bracing Method for each level (see Table 321.25-G), each labeled rectangle if more than one [see 321.25(8)(c)], and amount of bracing (# of braced panels or length of braced wall required) per the respective table (provide additional worksheets for additional rectangles as needed):

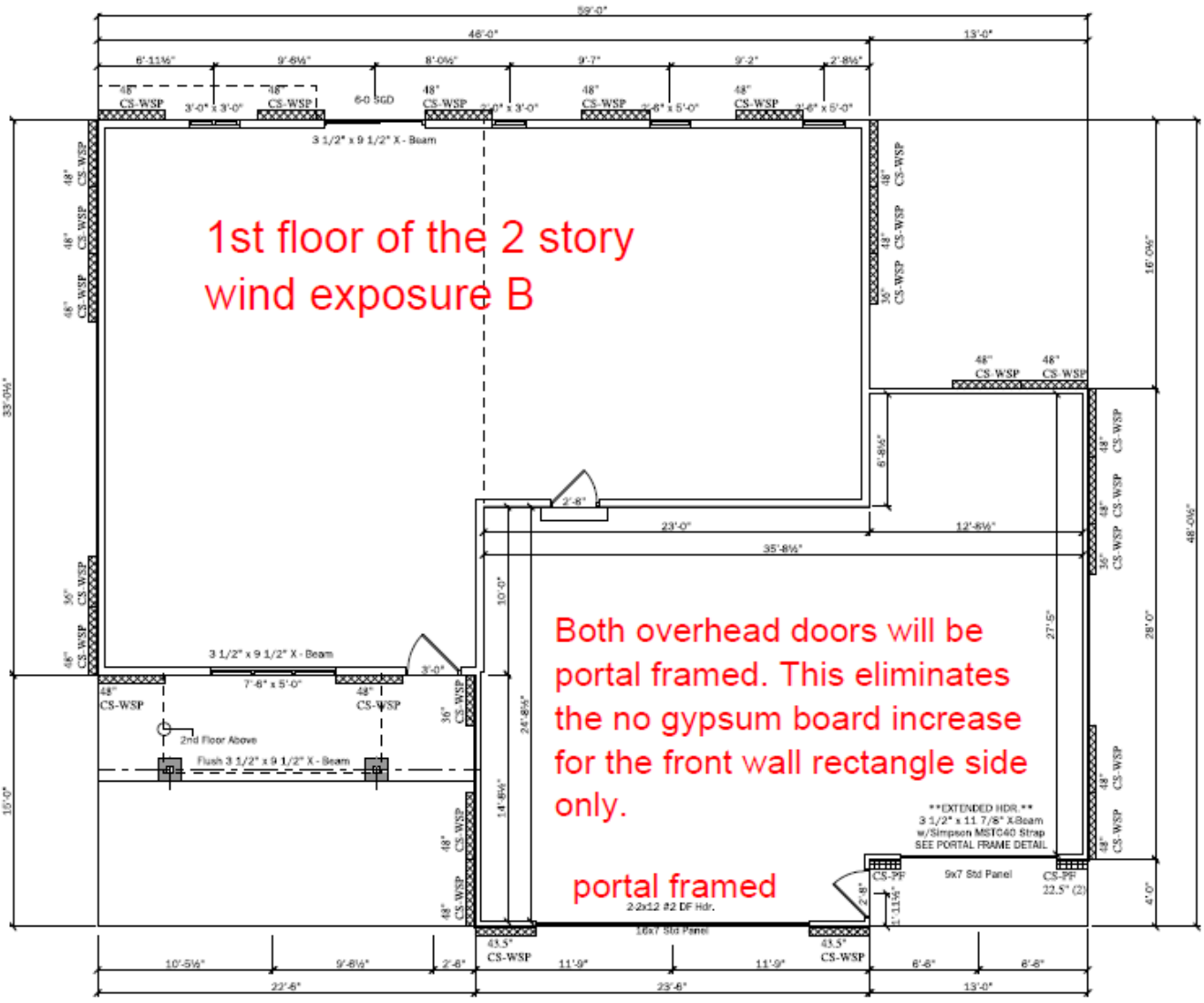
Rectangle: 1st fl Wall Ht. = B Eave to Ridge Ht. = C Max. Opening Ht. = D Wind Exp. = E

Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-I Min. panel width (Table 321.25-G) = _____		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-J Min. panel width (Table 321.25-H) = F		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = G	
	Long side	Short side	Long side	Short side	Long side	Short side
Roof and ceiling only						
One floor, roof and ceiling			H	I	J	K
Two floors, roof and ceiling						

Rectangle: 2nd floor Wall Ht. = M Eave to Ridge Ht. = N Max. Opening Ht. = O Wind Exp. = ____

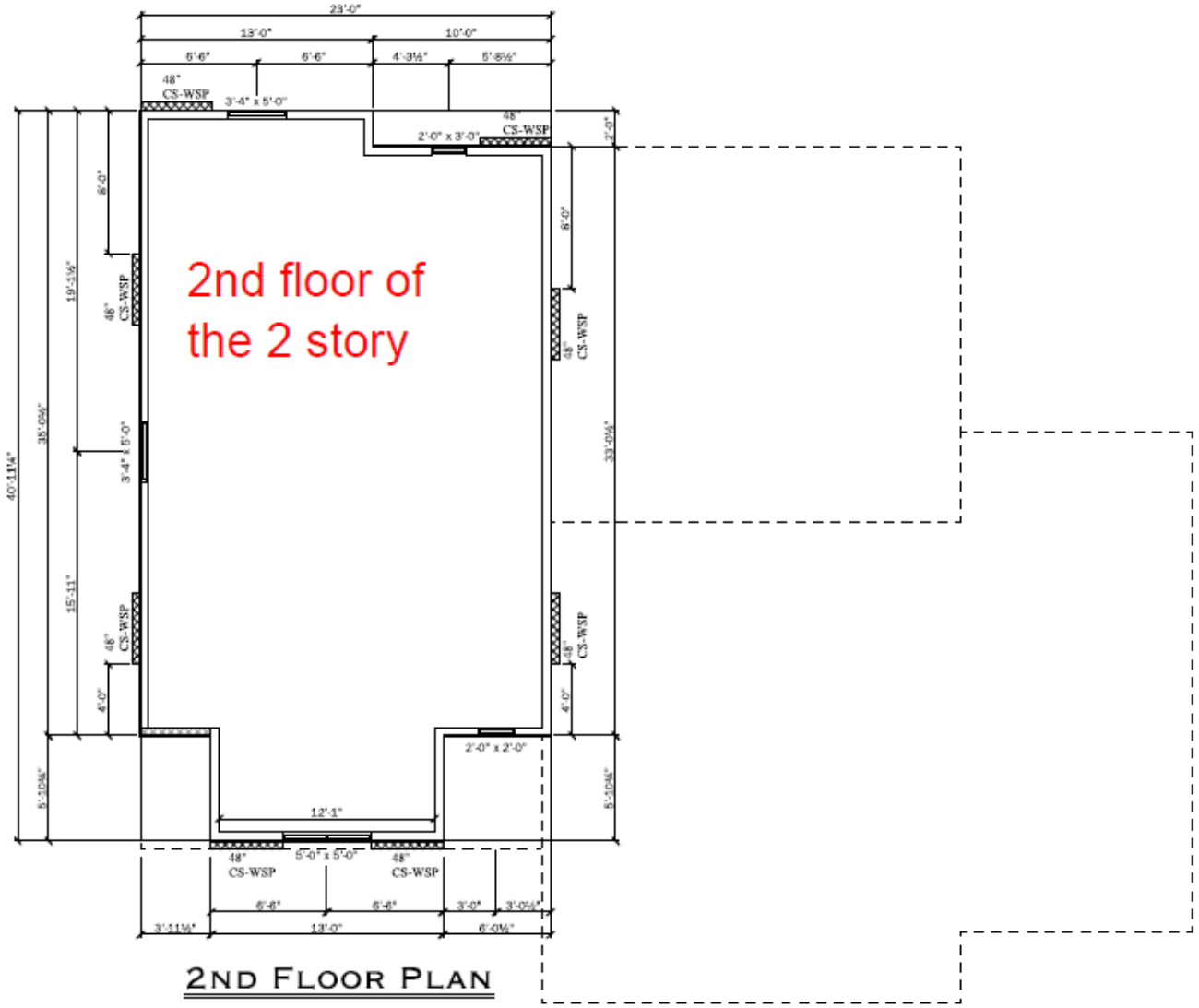
Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-1 Min. panel width (Table 321.25-G) = _____		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-H Min. panel width (Table 321.25-H) = Q		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = _____	
	Long side	Short side	Long side	Short Side	Long side	Short side
Roof and ceiling only			R	S		
One floor, roof and ceiling						
Two floors, roof and ceiling						

PF Method: For Intermittent bracing, per Table 321.25-I footnote 'h', each PF panel (16-24" wide per Figure 321.25-A) counts as ½ of a braced wall panel when determining compliance with Table 321.25-I. For Continuously Sheathed bracing, the actual length of each PF panel (16-24" wide per Figure 321.25-A) in feet counts toward the required total length of bracing required. For intermittent or continuous methods, each PF panel meeting min. required width of Fig. 321.25-A counts as a braced wall panel when evaluating panel spacing per Fig. 321.25-C.



Wall Compliance Information:

- Long side; 59’ (front and back)
- Short side: 48’-0 1/2” (left and right)
- House wall height: 8’-1 1/8” (T-321.25-G footnote b. actual wall height can exceed by up to 4”)
- Garage wall height: 9’-3 ¼”
- Top of wall to ridge height: 14’ 11”
- No gypsum wall board on exterior garage walls.
- Wall supporting: one floor, roof and ceiling.
- Minimum panel width next to a 6’-8” door: 32” for up to 8’-4 ½” and 30” for 9’-4 ½” tall walls.
- Long side front: 16.7’ (portal framed) x .95 (9’ wall height reduction T-321.25-J footnote c) = 15.86’ required and 19’-10 1/2” provided.
- Long side rear: 16.7’ x .95 x 1.4 (no gypsum board on garage walls T-321.25-J footnote d) = 22.21’ required and 23-5 1/2” provided.
- Short sides: 19.6’ x .95 x 1.4 = 26’ required and 28’ provided.
- Continuous Sheathing WSP on exterior walls



Wall Compliance Information:

- Long side; 40’-11 ¼”
- Short front and back sides: 23’
- House wall height: 8’-1 1/8”
- Garage wall height:
- Top of wall to ridge height: 10’
- Wall supporting: roof and ceiling.
- Minimum panel width next to a 5’-4” window: 24” for up to 8’-4 ½” tall walls.
- Short front and back sides: 7.5’ x .90 = 6.75’ required and 8’provided.
- Long sides: 5’ x .90 = 4.5’ required and 8’ provided
- Continuous Sheathing WSP on exterior walls

Use the worksheet on page 26 and diagrams on 27-28 to answer questions 123-140.

123. The letter B above represents the side wall height of ____. (House or garage-use tallest wall height)
    a. 8’-1 1/8”
    b. 9’-3 ¼”
    c. 10’
    d. 11’

124. The letter C above represents the eave to ridge height (changing to top-of-wall-to-top-ridge) ____.
    a. 8’
    b. 14’-11”
    c. 10’
    d. 11’
125. The letter D above represents the maximum open height of ____. (Use entrance door not PF O/H dr)
    a. 5’ 4”
    b. 6’ 8”
    c. 8’
    d. 9’
126. The letter E above represents the wind exposure ____.
    a. A
    b. B
    c. C
    d. D
127. The minimum panel width for F would be ____ inches. (Assume garage service door)
    a. 24
    b. 30
    c. 36
    d. 48
128. The minimum PF width for G would be ____ inches (9’-3 1/4”garage wall height- fig. 325.25-A)
    a. 16
    b. 18
    c. 22
    d. 24
129. The letter H above represents a minimum panel length of ____ required on the front side.
    a. 22.21’
    b. 26’
    c. 15.86’
    d. 19.5’
130. The provided panel length for the front side H above would be ____.
    a. 22.21’
    b. 23’-5 ½”
    c. 15.86’
    d. 19’-10 ½”
131. The letter H above represents a minimum panel length of ____ required on the rear side.
    a. 22.21’
    b. 26’
    c. 15.86’
    d. 19.5’
132. The provided panel length for the rear side H above would be ____.
    a. 22.21’
    b. 23’-5 ½”
    c. 15.86’
    d. 19’-10 ½”
133. The letter I above represents a minimum panel length of ____ required on both sides.
    a. 22.21’
    b. 26’
    c. 15.86’
    d. 19.5’

134. The provided panel length for both sides I above would be ____.
    a. 22.21’
    b. 26’
    c. 15.86’
    d. 28’
135. The letter J above represents the number of PF panels and that number would be ____.
    a. 0
    b. 2
    c. 3
    d. 4
136. The letter K above represents the number of PF panels and that number would be ____.
    a. 0
    b. 2
    c. 3
    d. 4
137. The letter M above represents the side wall height of ____. (House or garage-use tallest wall height)
    a. 8’-1 1/8”
    b. 9’-3 ¼”
    c. 10’
138. The letter O above represents the maximum open height of ____. (Use window & Table 321.25-H page 44 above)
    a. 5’ 4”
    b. 6’ 8”
    c. 8’
    d. 9’
139. The letter R above represents a minimum panel length of ____ required on front and back.
    a. 4.5’
    b. 2.26’
    c. 6.75’
    d. 9.5’
140. The letter S above represents a minimum panel length of ____ required on both sides.
    a. 4.5’
    b. 2.26’
    c. 6.75’
    d. 9.5’

Wall Bracing Compliance Worksheet

Complete this worksheet or provide equivalent information on the plans submitted with the permit application.

Sketch and dimension the building plan and the wall bracing rectangle(s) per 321.25(8)(c)1. and Figure 321.25-B. Provide and label additional sketches if the building plan/rectangles change at different floor levels.

Use this worksheet for the 1-1/2 story questions below.

This will be changing to "top of wall to top of ridge height"

Indicate applicable Wall Bracing Method for each level (see Table 321.25-G), each labeled rectangle if more than one [see 321.25(8)(c)], and amount of bracing (# of braced panels or length of braced wall required) per the respective table (provide additional worksheets for additional rectangles as needed):

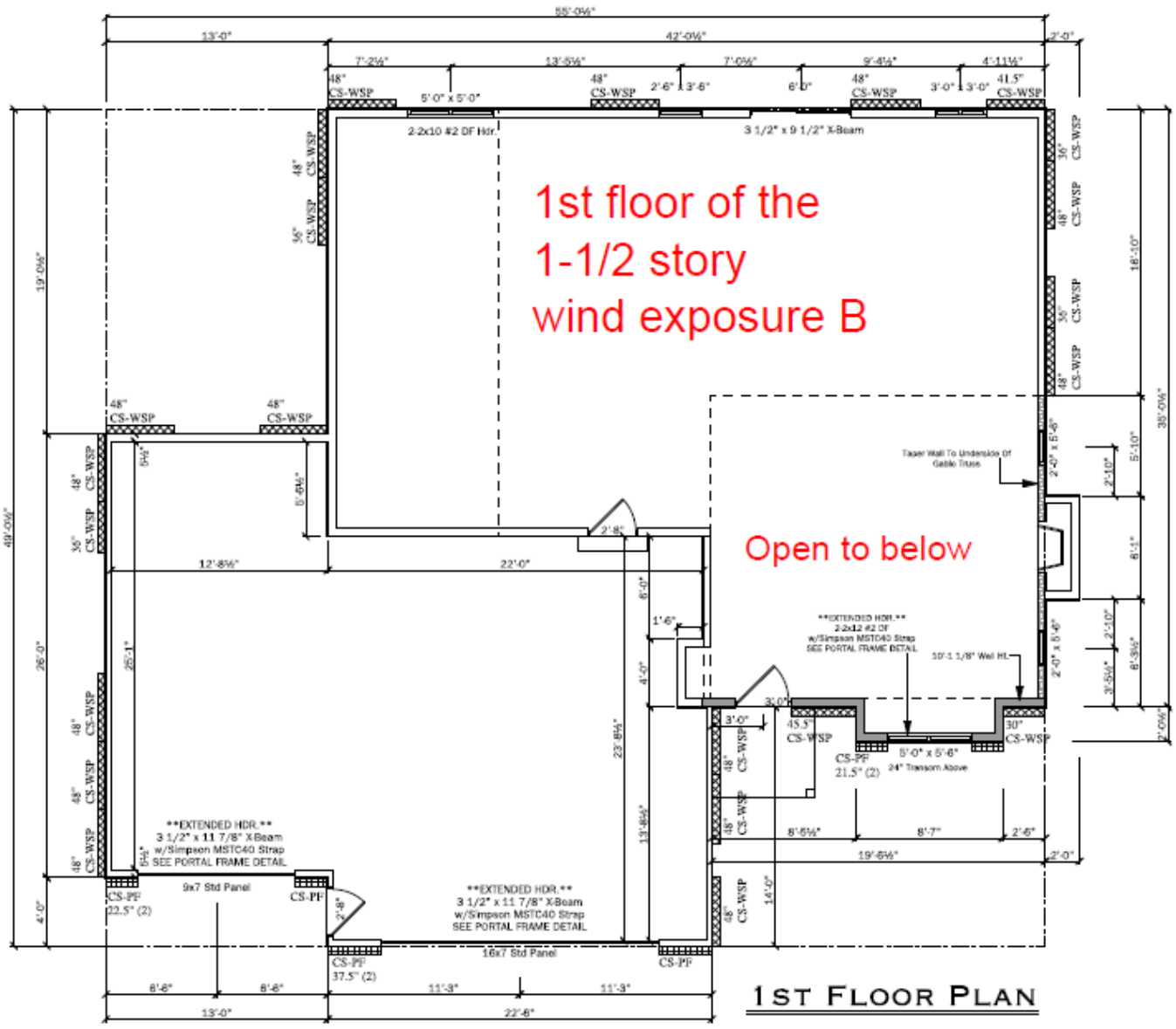
Rectangle: 1st fl Wall Ht. = B Eave to Ridge Ht. = C Max. Opening Ht. = D Wind Exp. = E

Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-I Min. panel width (Table 321.25-G) = _____		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-J Min. panel width (Table 321.25-H) = F		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = G	
	Long side	Short side	Long side	Short side	Long side	Short side
Roof and ceiling only						
One floor, roof and ceiling			H	I	J	K
Two floors, roof and ceiling						

Rectangle: 2nd floor Wall Ht. = M Eave to Ridge Ht. = N Max. Opening Ht. = O Wind Exp. = ____

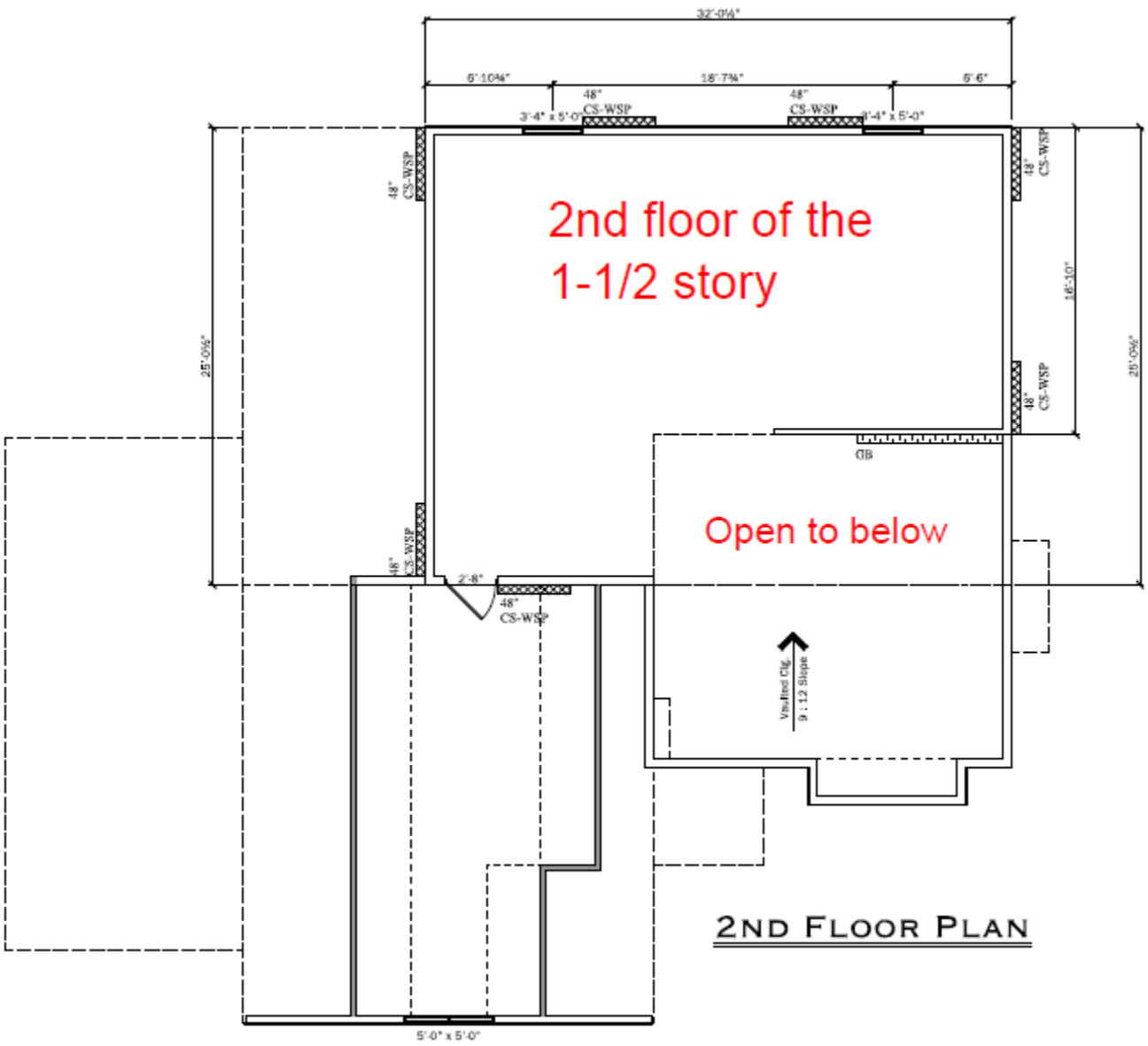
Walls Supporting:	Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-1 Min. panel width (Table 321.25-G) = _____		Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-H Min. panel width (Table 321.25-H) = Q		PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. Min. PF width (Fig. 321.25-A) = _____	
	Long side	Short side	Long side	Short Side	Long side	Short side
Roof and ceiling only			R	S		
One floor, roof and ceiling						
Two floors, roof and ceiling						

PF Method: For Intermittent bracing, per Table 321.25-I footnote 'h', each PF panel (16-24" wide per Figure 321.25-A) counts as ½ of a braced wall panel when determining compliance with Table 321.25-I. For Continuously Sheathed bracing, the actual length of each PF panel (16-24" wide per Figure 321.25-A) in feet counts toward the required total length of bracing required. For intermittent or continuous methods, each PF panel meeting min. required width of Fig. 321.25-A counts as a braced wall panel when evaluating panel spacing per Fig. 321.25-C.



Wall Compliance Information:

- Long side; 55’-0 ½” (front and back) and for the interpolation calculations use 55’ even.
- Short side: 49’-0 1/2” (left and right) and for the interpolation calculations use 49’ even.
- House wall height: 8’-1 1/8” (T-321.25-G footnote b. actual wall height can exceed by up to 4”)
- Garage wall height: 9’-3 ¼”
- Top of wall to ridge height: 14’
- No gypsum wall board on exterior garage walls.
- Wall supporting: one floor, roof and ceiling.
- Minimum panel width next to a 6’-8” door: 32” for up to 8’-4 ½” and 30” for 9’-4 ½” tall walls.
- Long side front: 16.7’ (portal framed) x .95 (9’ wall height reduction T-321.25-J footnote c) = 15.86’ required and 19’-10 1/2” provided.
- Long side rear: 16.7’ x .95 x 1.4 (no gypsum board on garage walls T-321.25-J footnote d) = 22.21’ required and 23-5 1/2” provided.
- Short sides: 19.6’ x .95 x 1.4 = 26’ required and 26’ provided.
- Continuous Sheathing WSP on exterior walls.



Wall Compliance Information:

- Long side; 32’-0 ½” (front and rear)
- Short sides: 25’-0 ½” (left and right)
- House wall height: 8’-1 1/8”
- Garage wall height:
- Top of wall to ridge height: 9’-4”
- Wall supporting: roof and ceiling.
- Minimum panel width next to a 5’-4” window: 24” for up to 8’-4 ½” tall walls.
- Long front and rear sides: 5’ x .90 = 4.5’ required and 8’ provided
- Short sides: 6’ x .90 = 5.4’ required and 8’provided.
- Continuous Sheathing WSP on exterior walls

Use the worksheet on page 31 and diagrams on 32-33 to answer questions 141-153

141. The letter B above represents the side wall height of ____. (House or garage-use tallest wall height)
    a. 8'-1 1/8"
    b. 9'-3 ¼"
    c. 10'
    d. 11'
142. The letter C above represents the eave to ridge height (changing to top-of-wall-to-top-ridge) ____.
    a. 8'
    b. 14'
    c. 10'
    d. 11'
143. The letter D above represents the maximum open height of ____. (Use entrance door not PF O/H dr)
    a. 5' 4"
    b. 6' 8"
    c. 8'
    d. 9'
144. The minimum panel width for F would be ____ inches. (Table 321.25-H page 44 above)
    a. 24
    b. 30
    c. 36
    d. 48
145. The minimum PF width for G would be ____ inches. (9'-3 1/4"garage wall height- fig. 325.25-A)
    a. 16
    b. 18
    c. 22
    d. 24
146. The letter H above represents a minimum panel length of ____ required on the front. Use exposure B and Table 321.25-J footnote c.
    a. 22.21'x 1.6
    b. 15.86'
    c. 15.86' x 1.3
    d. 15.86' x 1.6
147. The letter H above represents a minimum panel length of ____ required on the rear. Use exposure B and Table 321.25-J footnote c.
    a. 22.21' x 1.6
    b. 22.21'x 1.3
    c. 15.86' x 1.3
    d. 22.21'

Extra practice question. The letter H above represents a minimum panel length of ____ required on the front. Use exposure C and Table 321.25-J footnote c.
    a. 22.21'x 1.6
    b. 26' x 1.3
    c. 15.86' x 1.3
    d. 15.86' x 1.6

148. The letter H above represents a minimum panel length of ____ required on the rear. Use exposure D and Table 321.25-J footnote c.
    a. 22.21' x 1.6
    b. 22.21'x 1.3
    c. 15.86' x 1.3

d. 19.5’ x 1.3

149. The letter I above represents a minimum panel length of ____ required on both sides.

a. 22.21’
b. 26’
c. 15.86’
d. 19.5’

One way interpolation will be used for the next two questions

15	Roof and ceiling only		2.6[i]	4.6	6.5	7.8	9.8	11.7	13.7	15.7
	One floor, roof and ceiling		4.0	7.5	10.4	13.8	16.7	19.6	22.9	26.2
	Two floors, roof and ceiling		5.5	10.5	14.9	19.3	23.7	27.5	32.1	36.7

150. Only the **length of perpendicular side** interpolation will be included in this calculation from Table 321.25-J and footnote. The letter H above represents a minimum panel length of ____ required on the **long side rear**. 16.7 - 13.8 = 2.9 now divide 2.9 by 10 (10 is the difference between 50’ – 40’) = .29 per each foot. The side length is 49’ & 9’ > 40’ or 9 x .29 = 2.61. We will add the 2.61 + 13.8 to equal?

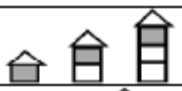
a. 22.21’ x 1.4 no gypsum board x .95 wall height reduction
b. 16.41’ x 1.4 no gypsum board x .95 wall height reduction
c. 15.86’ x 1.4 no gypsum board x .95 wall height reduction
d. 19.5’ x 1.4 no gypsum board x .95 wall height reduction

151. Only the **length of perpendicular side** interpolation will be included in this calculation from Table 321.25-J and footnote a. The letter I above represents a minimum panel length of ____ required on **both short sides.** 19.6 – 16.7 = 2.9 now divide 2.9 by 10 (10 is the difference between 60’ – 50’) = .29 per each foot. The side length is 55’ & 5’ > 50’ or 5 x .29 = 1.45. We will add the 1.45 + 16.7 to equal?

a. 22.21’ x 1.4 no gypsum board x .95 wall height reduction
b. 20.21’ x 1.4 no gypsum board x .95 wall height reduction
c. 15.86’ x 1.4 no gypsum board x .95 wall height reduction
d. 18.15’ x 1.4 no gypsum board x .95 wall height reduction

Two way interpolations will be used for the next two questions

Table 321.25–J
REQUIRED LENGTH OF CONTINUOUS BRACING ON WALLS PARALLEL TO EACH RECTANGLE SIDE AT EACH FLOOR LEVEL[a,b,c,d, e,g,h]

Top-of-Wall-to-Ridge Height (feet)	Wall Supporting:		Total Required Length (feet) of Full-Height Bracing on Any Side of Rectangle							
			Length of Perpendicular Side (feet)[f]							
			10	20	30	40	50	60	70	80
10	Roof and ceiling only		2.0[i]	3.5[i]	5.0	6.0	7.5	9.0	10.5	12.0
	One floor, roof and ceiling		3.5[i]	6.5	9.0	12.0	14.5	17.0	19.8	22.6
	Two floors, roof and ceiling		5.0	9.5	13.5	17.5	21.5	25.5	29.2	33.4

15	Roof and ceiling only		2.6[i]	4.6	6.5	7.8	9.8	11.7	13.7	15.7
	One floor, roof and ceiling		4.0	7.5	10.4	13.8	16.7	19.6	22.9	26.2
	Two floors, roof and ceiling		5.5	10.5	14.9	19.3	23.7	27.5	32.1	36.7

Interpolation cheat sheet "Length of Perpendicular Side" (one floor, roof, & ceiling)

	40'		**50'**		**60'**
10'	12'	10'	14.5'	10'	17'
11'	12.36'	11'	14.94'	11'	17.52'
12'	12.72'	12'	15.38'	12'	18.04'
13'	13.08'	13'	15.82'	13'	18.56'
14'	13.44'	14'	16.26'	14'	19.08'
15'	13.8'	15'	16.7'	15'	19.6'

152. Both top of wall to ridge height and length of perpendicular side interpolations will be included in this calculation from Table 321.25-J and footnote. The letter H above represents a minimum panel length of ____ required on the **long side rear**. 16.26 - 13.44 = 2.82 now divide 2.82 by 10 (10 is the difference between 50' – 40') = .282 per each foot. The side length is 49' & 9' > 40' or 9 x .282 = 2.538. We will add the 2.538 + 13.44 to equal the letter H above.

a. 22.21' x 1.4 no gypsum board x .95 wall height reduction
b. 15.978' x 1.4 no gypsum board x .95 wall height reduction
c. 15.86' x 1.4 no gypsum board x .95 wall height reduction
d. 19.5' x 1.4 no gypsum board x .95 wall height reduction

153. Both top of wall to ridge height and length of perpendicular side interpolations will be included in this calculation from Table 321.25-J and footnote a. The letter I above represents a minimum panel length of ____ required on **both short sides.** 19.08 – 16.26 = 2.82 now divide 2.82 by 10 (10 is the difference between 60' – 50') = .282 per each foot. The side length is 55' & 5' > 50' or 5 x .282 = 1.41. We will add the 1.41 + 16.26 to equal to equal the letter I above.

a. 22.21' x 1.4 no gypsum board x .95 wall height reduction
b. 20.21' x 1.4 no gypsum board x .95 wall height reduction
c. 15.86' x 1.4 no gypsum board x .95 wall height reduction
d. 17.67' x 1.4 no gypsum board x .95 wall height reduction

154. The letter J above represents the number of PF panels and that number would be ____.

a. 0
b. 2
c. 3
d. 4

155. The letter K above represents the number of PF panels and that number would be ____.

a. 0
b. 2
c. 3
d. 4

156. The minimum panel width for Q would be ____ inches. (Assume window)

a. 24
b. 30
c. 36

d. 48

157. The letter R above represents a minimum panel length of ____ required on the front and rear sides.
a. 4.5’
b. 2.26’
c. 5.4’
d. 9.5’

158. The letter S above represents a minimum panel length of ____ required on both sides.
a. 4.5’
b. 2.26’
c. 5.4’
d. 9.5’

Frequently Asked Questions/UDC Wall Bracing Emergency Rules. Effective date of Emergency Rules April 1, 2014

1a. What was the emergency necessitating the emergency rule provisions for wall bracing?
Some building designers, home builders, and regulatory officials performing permitting, plan review and inspections found the previous rules for wall bracing for one- and two family dwellings were too difficult to understand and apply, which resulted in unnecessary costs and delays in home building. Promulgating revisions to the rules through the emergency rule process was needed in order to avoid these costs and delays as soon as possible. In addition, the report that the Dwelling Code Council is required to complete by July 1, 2014, under section 101.62 (4) of the Statutes is expected to include recommendations to clarify and simplify these rules through the emergency rule process.

2b. Are additional resources available?
Yes, see the department's home page at the link below for a short video providing explanation of the meaning and use of the new provisions. There is also a non-mandatory compliance worksheet available for use and a 'Guide' on how to use the emergency rule provisions based on the compliance worksheet.
http://dsps. wi.gov/Home

3c. How long are the emergency rules in place and are permanent rules being developed?
The emergency rules with permissible extensions if approved could be in place until no later than December 26, 2014.
Yes, subsequent to the emergency rules the Uniform Dwelling Code Council proceeded to develop permanent rules which if approved through the rulemaking process could become effective as early as August 2014 and will clarify many items within the emergency rules and addressed within this FAQ document.

4d. I am very comfortable using and complying with the current UDC Wall Bracing provisions. May I continue to use this method after the effective date of the Emergency Rules?
No, while the design wind pressure remains unchanged at 20 psf the new provisions are based on the 2012 International Residential Code (IRC) Simplified Wall Bracing Method. The 2012 IRC Simplified Method (and prior 2009 IRC Wall Bracing Provisions) were the result of an Ad Hoc Wall Bracing Committee established by the International Code Council. This committee developed a rational design approach for wall bracing taking into consideration recent research and large scale testing by Simpson Strong Tie, National Association of Home Builders, and other industry stakeholders as well as several conventional wood frame whole house tests. In some cases the emergency rules may require slightly more bracing and the bracing to be distributed in different locations than what was required under the previous WI Uniform Dwelling Code wall bracing provisions while at the same time providing a simplified approach and greater flexibility to achieve code compliance.

5e. When reviewing plans and processing permit applications how does one determine which rules to apply?
The 'code applies' date is the date upon which a valid permit application is received by the authority having jurisdiction. If received prior to the effective date the current wall bracing provisions OR the simplified method in the emergency rules may be used. If received after the effective date of the

emergency rules the emergency rules shall be used to determine compliance with the wall bracing requirements.

159. In addition, the report that the Dwelling Code Council is required to complete by_____ under section 101.62 (4) of the Statutes is expected to include recommendations to clarify and simplify these rules through the emergency rule process.

a. June 1, 2014
b. July 1, 2014
c. August 1, 2014
d. December 26, 2014.

160. The new provisions are based on the _____ International Residential Code (IRC) Simplified Wall Bracing Method.

a. 2006
b. 2009
c. 2012
d. all of the above

161. The new provisions are based on the design wind pressure of _____.

a. 20 psi
b. 20 psf
c. 40 psf
d. none of the above

162. What rule(s) apply if the permit and plans are received after the effective date?

a. the current wall bracing provisions rules apply
b. the simplified method in the emergency rules
c. both a and b
d. none of the above

6f. Table 321.25-A The new stud height and spacing table doesn't appear to meet industry standards for deflection limits for some interior and exterior finishes, doors and windows, etc. is this a problem?

The Table in the emergency rules does not include the conditions or limitations for its use and thus it is advisable to consider the impacts on product warranties, serviceability, durability, etc. which may be impacted by excessive deflection beyond industry standards. The Table has been revised to include design conditions and limitations for its use in the permanent rule package.

7g. Section 321.25(8)(a) and Figure 321.25-B How do the wall bracing provisions apply to methods of construction other than 'stick built' such as post frame, log homes, structural insulated panels (SIP's), insulated concrete forms (ICF's), etc.? How do you apply the wall bracing provision to a home with a walk out basement where some of the walls are concrete and other walls or portions thereof are wood-framed?

SPS 321.25 (8) WALL BRACING. (a) General. Dwellings using wood-framed walls shall be braced in accordance with this section. Where a building, or a portion thereof does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

The code language above indicates the requirements only apply to wood-framed walls, ie stick built with studs max 24" o.c. Therefore other methods of construction must be designed per applicable adopted standards and accepted engineering practice.

Walk-out basement: The department considers a minimum 8" nominal thickness poured in place concrete basement wall as equivalent in lateral load/shear resistance to any of the allowable wood-framed wall bracing materials. To determine the required bracing for a walk out basement first draw a rectangle around the entire floor plan and projections as if all of the walls are wood-framed. Determine the required bracing amounts per the chosen bracing material and method and then locate the bracing to meet the requirements of Figure 321.25-C. Any required braced wall panel locations that occur on a wall or portion

of a wall that is actually of poured in place concrete construction is considered equivalent and that amount of bracing will count towards the minimum required amount and will not need to be provided in another location.

163. The new stud height and spacing table _____ to meet industry standards for deflection limits for some interior and exterior finishes, doors and windows, etc.

a. does appear
b. doesn't appear
c. almost appears
d. should appear

164. The wall bracing rules apply to:

a. structural insulated panel homes
b. log homes
c. wood-framed wall homes
d. all of the above.

165. Where a building, or a 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 _____.

a. SPS 321.25(8)
b. accepted engineering practice
c. both a & b
d. none of the above

166. The department considers a minimum ___" nominal thickness poured in place concrete basement wall as equivalent in lateral load/shear resistance to any of the allowable wood-framed wall bracing materials.

a. 6
b. 7
c. 8
d. 10

167. The code language above indicates the requirements only apply to wood-framed walls, ie stick built with studs max ____" o.c.

a. 12
b. 16
c. 19.3
d. 24

8h. Table 321.25-G Can bracing materials and methods be mixed & matched on the same floor level or from one floor level to the next?

Yes, bracing materials can be mixed on any given rectangle side, within a story or from one story to the next. In addition, bracing methods either intermittent or continuous can be mixed within a story or from one story to the next. However, on any given rectangle side you cannot mix intermittent and continuously sheathed methods.

9i. Table 321.25-G and SPS 321.25 (8) (c) 6. require the interior side of all exterior walls to be sheathed with a minimum 1/2" gypsum wall board. Since portal frame wall panels are listed under Table 321.25-G, is it the intent to require drywall on the interior of Portal Frame braced panels?

No. That is not the intent. Figure 321.25-A as referenced in Table 321.25-G for Portal Frame method in the cross section and construction details does not show ½" drywall on the interior of the Portal Frame braced panels. The intent for the· PF is to follow the same exception as in Section R602.10.4 (exception 1) in the 2012 IRC.

10j. Table 321.25-G footnote 'a', Table 321.25-1 footnote 'e', and Table 321.25-J footnote 'd'. Are braced wall panels on a gable end wall required to be sheathed full height on the interior with 1/2"

gypsum board where the wall extends above the ceiling and faces normally unfinished attic space on the interior of the dwelling?
Yes, unless the required amount of bracing on the rectangle side is increased by the applicable 1.4 adjustment factor per Table 321.25-I footnote 'e' or Table 321.25-J footnote 'd'.

168. _____ bracing method can be mixed within a story or from one story to the next.
a. Intermittent
b. Continuous
c. both a or b
d. none of the above
169. Bracing materials can be mixed _____.
a. on any given rectangle side
b. within a story
c. from one story to the next
d. all of the above

11k. Tables 321.25-G, H, I, and J. On a gable end wall how do you measure the nominal wall height?
When using Tables 321.25-G and H to determine the maximum allowable height and minimum width of a braced wall panel the wall height is measured from the bottom of the bottom plate up to the underside of the roof deck/diaphragm. If the height of the braced wall panel exceeds 12' it can have a maximum height to width ratio of 2.5:1 which is clarified in the proposed permanent rule package.
When using Tables 321.25-I and J to determine the required amount of bracing the nominal wall height is measured to the top of the wall top plate at the bearing elevation of the roof structural assembly (trusses or rafters).
12 l. Table 321.25-H Is linear interpolation allowed in this table?
Yes. This has been clarified by adding a footnote to the Table in the permanent rule package.
13m. Figure 321.25-A Does the portal frame design require 7/16" OSB or plywood on all sheathable surfaces?
It depends on the bracing method being used for that rectangle side. If using the intermittent method- No. If using the Continuously Sheathed method- Yes.

170. Portal frame design requires 7/16" OSB or plywood on all sheathable surfaces if using the:
a. continuously sheathed method
b. intermittent method
c. both a & B
d. none of the above
171. If the height of the braced wall panel exceeds ____ it can have a maximum height to width ratio of 2.5:1 which is clarified in the proposed permanent rule package.
a. 9’
b. 10’
c. 11’
d. 12’
172. If the height of the braced wall panel is 14' and it can have a maximum height to width ratio of 2.5:1 which is clarified in the proposed permanent rule package. What would this required panel width be?
a. 4’
b. 4.6’
c. 5’
d. 5.6’

14n. Figure 321.25-A, the first 2 1ines under the heading indicate, depending on the extent of the header with double or single portal frame, that the portal frame counts as one or two braced wall panels (depending on width). Table 321.25-1 footnote 'g' states the following braced wall panel conditions shall be permitted to be counted as one-half a braced wall panel toward meeting the required number of panels: (5)one PF panel complying with Figure 321.25-A. How do you count portal frame panels when determining how much bracing they provide towards meeting the minimum required amount?

Intermittent bracing method: Per Table 321.25-1 footnote 'g' a single narrow portal frame panel at one side of the opening counts as one-half a braced wall panel. A narrow portal frame panel at each side of the opening would count as one full braced panel.

Continuously Sheathed bracing method: Table 321.25-J indicates the minimum required total length of continuously sheathed panels and Figure 321.25-A indicates the minimum required width of a narrow portal frame panel dependent upon the total wall height. The actual width of the portal frame panel in feet (16-24" per the figure) counts towards the minimum required total length of continuously sheathed panels determined from Table 321.25-J.

15o. Figure 321.25-A Are oversize 2"x2"x3/16" plate washers still required for portal frame anchorage to concrete?

No the emergency rules do not require the oversized plate washers. The proposed permanent rules will again require the oversized plate washers for adequate anchorage of narrow portal frame braced panels.

173. Table 321.25-J indicates the minimum required total length of continuously sheathed panels and Figure 321.25-A indicates the minimum required width of a narrow portal frame panel dependent upon the total wall height. The actual width of the portal frame panel in feet (16-24" per the figure) counts towards the minimum required total length of _____.

a. intermittently sheathed panels
b. continuously sheathed panels
c. both a & b
d. none of the above

174. Per Table 321.25-1 footnote 'g' a single narrow portal frame panel at one side of the opening counts as one-half a braced wall panel. A narrow portal frame panel at each side of the opening would count as one full braced panel. This sentence defines the:

a. intermittently bracing method
b. continuously sheathed bracing method
c. both a & b
d. none of the above

16p. 321.25(8)(c)7. allows balloon frame walls up to two floors in height but Tables 321.25-1 and J do not permit extrapolation beyond 12' wall height. Are braced wall panels allowed on a two floor balloon frame wall and if so how wide must the panels be?

Extrapolation is prohibited in Tables 321.25-1 and J so the provisions may not be used on a building of an overall larger size and height than indicated in the bracing amount tables. Balloon frame walls should be viewed as an exception for a portion of the overall structure not the whole building. If braced wall panels must be located on the balloon frame portion they shall have a maximum height to width ratio of 2.5: 1.

17q. Figure 321.25-B footnote 'b'. Can you define what is meant by enclosed plan offsets and projections? Is a screen porch classified or defined as enclosed?

There are definitions currently in the UDC that provide guidance on this topic. SPS 320.07(59m) definition of a "Porch" means an unenclosed exterior structure at or near grade attached or adjacent to the exterior wall of any building, and having a roof and floor. SPS 320.07(10t) definition of a "Carport" means a structure used for storing motorized vehicles that is attached to a dwelling and has at least 2 sides completely unenclosed. Carports are specifically exempted as are open structures such as decks. A deck is a porch without a roof. A screen porch with no enclosing walls of any height and no other construction

other than the structural members necessary to support the roof and the screen itself will be considered an open structure that can be excluded from the rectangle.

175. Rectangles shall surround all enclosed plan offsets and projections._____, such as carports and decks, shall be excluded from the rectangle.

a. chimneys
b. partial height projections
c. open structures
d. all of the above

176. A balloon framed wall 14' tall shall have a maximum height to width ratio of 2.5: 1 or a panel width of _____. (14 divided by 2.5)

a. 4'
b. 4.6'
c. 5'
d. 5.6'

18u. Figure 321.25-B, Do rectangles have to abut at a wall line? Can it be a 100% interior wall line? How do you draw rectangles for homes with segments constructed at an angle or an attached garage at an angle to the dwelling?

Generally speaking, yes you want adjacent rectangles to abut at a common wall line which will be at least partially an interior wall line. It is permissible for rectangles to overlap but this will result in more bracing being required than if the rectangles did not overlap.

For guidance on drawing rectangles for homes with angled segments or attached garages at an angle to the dwelling see the added diagrams in the proposed· permanent rule package which also provide a method for calculating the amount of bracing which can be attributed to an angled wall segment.

19r. Tables 321.25-H, I, and J If a dwelling has varying wall heights, wind exposure categories, opening heights, etc. on each rectangle side how are the requirements and Tables to be applied? Are the most restrictive requirements applied to the entire building, to each rectangle, each rectangle side or to each braced wall panel?

It depends on the requirement being considered. The prescriptive requirements are a simplified method which attempt to strike a balance between practicality, simplicity and ease of use versus specificity and complexity.

Tables 321.25-I and J Bracing Amounts.

When applying these tables you must use the most restrictive variables for wall height and floor levels for the rectangle being considered. If the wall heights and number of floor levels vary an alternative would be to draw the rectangles differently so that each rectangle encompasses constant conditions.

For wind exposure category you could have and use different wind exposure categories for each wind direction or use the most restrictive or worst case wind exposure when evaluating the required bracing in both orthogonal directions (composed of right angles). For eave to ridge height (soon to be top of wall to ridge) it should be determined using the roof structure located on the portion of the building with the greatest number of floor levels (ie highest walls).

Table 321.25-H

For braced panels located in walls of differing heights and with openings of differing heights the braced wall panel limitations are based on the context of its location and immediately surrounding conditions. So the minimum width of a braced wall panel may be determined based on the wall height and opening height where it is located.

177. It is permissible for rectangles to overlap but this will result in _____ bracing being required rather than if the rectangles did not overlap.

a. less
b. equal

c. more
d. none of the above

20s. Tables 321.25-1 and J. On a dwelling with varying number of stories, roof bearing elevations and roof heights what eave to ridge distance must I use when -applying the bracing amount tables?
Generally, the most restrictive variables for the entire rectangle must be used when applying Tables 321.25-1 and J to determine the required bracing amounts. The eave to ridge height of the roof with the highest roof bearing elevation and greatest number of floor levels must be utilized when applying the bracing tables. An alternative would be to draw additional rectangles for portions of the dwelling with fewer floor levels and lesser eave to ridge height. ·

21t. Tables 321.25-1 and J Are bonus rooms considered another floor level when applying the bracing amount tables? Do the walls associated with roof dormers create an additional floor level when applying the tables?
No, a bonus room contained wholly within an attic truss does not create an additional floor level when applying the bracing amount tables since the tables are based on the wall surface area subjected to lateral wind load and not the vertical uniform live loads associated with a floor level. Similarly for a dormer, being only a small portion of the overall roof area the amount of wall surface can be considered negligible in most cases (except maybe a large shed dormer or a story and a half cape cod home) and the wind load applied as if it is roof surface.

22u. Table 321.25-1 in one case lists 1 braced wall panel as the minimum required but SPS 321.25 (8) (c) 2. says you can never have less than 2 braced wall panels, which is correct?
Both. The Table lists 1 braced wall panel as the starting point for calculating the minimum number of braced wall panels required considering all of the adjustment factors in the footnotes that could apply. This allows a more accurate determination of the required amount of bracing without 'over bracing' when applying the footnote adjustment factors. If however, after applying the required adjustment factors the calculated number of braced wall panels is less than 2, SPS 321.25(8)(c)2. applies and the minimum number of braced panels on a rectangle side is 2.
The same logic applies to Table 321.25-J for the continuously sheathed method and the minimum required length of bracing and the minimum width of a CS braced panel per Table 321.25-H compared to the requirement of 321.25(8)(c)2.

178. Bonus room contained wholly within an attic truss system creates an additional floor level and possibly an addition rectangle.
a. true
b. false

23v. Table 321.25-J, Eave-to-Ridge Height (feet) column: Should the numbers read, "0-10, 10-15, 15-20" or do you have to interpolate values for, say a 12-foot roof or an 18-foot roof?
Per table footnote 'a' interpolation shall be permitted when using the table but is not required. If interpolation is not used, then if the eave to ridge height falls between two of the rows, the next highest value/row for eave to ridge height must be used. For example, if the eave to ridge height is 12' the row for eave to ridge height of 15' must be used to determine the required length of bracing.

24w. Table 321.25-J, Do the adjustment factors in the footnotes apply cumulatively (as with intermittent)?
Yes. This has been clarified in the proposed permanent rule package by adding a footnote to the table indicating the adjustment factors apply cumulatively.

25x. Figure 321.25-C Where does the 21-foot spacing begin and end with a portal frame?
Per Figure 321.25-A a portal frame whether consisting of one or two narrow panels has a maximum opening dimension of 18' and therefore will automatically comply with the 21' spacing requirement. If only one side of the opening has a narrow panel the opposite side is required to be either a wood structural panel (WSP) if using the intermittent method or a continuously sheathed wood structural panel (CS-WSP)

if using the continuous method. Then, at the outer extent of the portal frame figure whether it is a narrow panel or standard braced wall panel you measure the 21' away from portal frame from the outside edge of the panel in the figure to the outside edge of the next nearest panel.

26y. Can a hole be made in a braced wall panel, and if so, are there restrictions on the location?

Yes holes can be made in braced wall panels. There are no clear limitations within the emergency rules on size or location of what one might consider 'small' holes or penetrations in a braced wall panel. The rules do address large openings such as doors and windows as relates to minimum width of continuously sheathed braced panels per Table 321.25-H.

Designers or builders may wish to consult with an engineer to determine reasonable limits on openings and penetrations based on accepted engineering practice. Limitations on holes within a braced wall panel are contained in the proposed permanent rule package.

179. Portal frame has a maximum opening dimension of ____ feet.
    a. 16
    b. 18
    c. 20
    d. none of the above

180. Can a hole be made in a braced wall panel, and if so, are there location restrictions? See Table:
    a. 321.25-H footnote a
    b. 321-25-G footnote e
    c. 321-25-G footnote f
    d. none of the above

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1	a	b	c	d	21	a	b	c	d	41	a	b	c	d
2	a	b	c	d	22	a	b	c	d	42	a	b	c	d
3	a	b	c	d	23	a	b	c	d	43	a	b	c	d
4	a	b	c	d	24	a	b	c	d	44	a	b	c	d
5	a	b	c	d	25	a	b	c	d	45	a	b	c	d
6	a	b	c	d	26	a	b	c	d	46	a	b	c	d
7	a	b	c	d	27	a	b	c	d	47	a	b	c	d
8	a	b	c	d	28	a	b	c	d	48	a	b	c	d
9	a	b	c	d	29	a	b	c	d	49	a	b	c	d
10	a	b	c	d	30	a	b	c	d	50	a	b	c	d
11	a	b	c	d	31	a	b	c	d	51	a	b	c	d
12	a	b	c	d	32	a	b	c	d	52	a	b	c	d
13	a	b	c	d	33	a	b	c	d	53	a	b	c	d
14	a	b	c	d	34	a	b	c	d	54	a	b	c	d
15	a	b	c	d	35	a	b	c	d	55	a	b	c	d
16	a	b	c	d	36	a	b	c	d	56	a	b	c	d
17	a	b	c	d	37	a	b	c	d	57	a	b	c	d
18	a	b	c	d	38	a	b	c	d	58	a	b	c	d
19	a	b	c	d	39	a	b	c	d	59	a	b	c	d
20	a	b	c	d	40	a	b	c	d	60	a	b	c	d

UDC Wall Bracing Provisions quiz 180

61	a	b	c	d	101	a	b	c	d	141	a	b	c	d
62	a	b	c	d	102	a	b	c	d	142	a	b	c	d
63	a	b	c	d	103	a	b	c	d	143	a	b	c	d
64	a	b	c	d	104	a	b	c	d	144	a	b	c	d
65	a	b	c	d	105	a	b	c	d	145	a	b	c	d
66	a	b	c	d	106	a	b	c	d	146	a	b	c	d
67	a	b	c	d	107	a	b	c	d	147	a	b	c	d
68	a	b	c	d	108	a	b	c	d	148	a	b	c	d
69	a	b	c	d	109	a	b	c	d	149	a	b	c	d
70	a	b	c	d	110	a	b	c	d	150	a	b	c	d
71	a	b	c	d	111	a	b	c	d	151	a	b	c	d
72	a	b	c	d	112	a	b	c	d	152	a	b	c	d
73	a	b	c	d	113	a	b	c	d	153	a	b	c	d
74	a	b	c	d	114	a	b	c	d	154	a	b	c	d
75	a	b	c	d	115	a	b	c	d	155	a	b	c	d
76	a	b	c	d	116	a	b	c	d	156	a	b	c	d
77	a	b	c	d	117	a	b	c	d	157	a	b	c	d
78	a	b	c	d	118	a	b	c	d	158	a	b	c	d
79	a	b	c	d	119	a	b	c	d	159	a	b	c	d
80	a	b	c	d	120	a	b	c	d	160	a	b	c	d
81	a	b	c	d	121	a	b	c	d	161	a	b	c	d
82	a	b	c	d	122	a	b	c	d	162	a	b	c	d
83	a	b	c	d	123	a	b	c	d	163	a	b	c	d
84	a	b	c	d	124	a	b	c	d	164	a	b	c	d
85	a	b	c	d	125	a	b	c	d	165	a	b	c	d
86	a	b	c	d	126	a	b	c	d	166	a	b	c	d
87	a	b	c	d	127	a	b	c	d	167	a	b	c	d
88	a	b	c	d	128	a	b	c	d	168	a	b	c	d
89	a	b	c	d	129	a	b	c	d	169	a	b	c	d
90	a	b	c	d	130	a	b	c	d	170	a	b	c	d
91	a	b	c	d	131	a	b	c	d	171	a	b	c	d
92	a	b	c	d	132	a	b	c	d	172	a	b	c	d
93	a	b	c	d	133	a	b	c	d	173	a	b	c	d
94	a	b	c	d	134	a	b	c	d	174	a	b	c	d
95	a	b	c	d	135	a	b	c	d	175	a	b	c	d
96	a	b	c	d	136	a	b	c	d	176	a	b	c	d
97	a	b	c	d	137	a	b	c	d	177	a	b	c	d
98	a	b	c	d	138	a	b	c	d	178	a	b	c	d
99	a	b	c	d	139	a	b	c	d	179	a	b	c	d
100	a	b	c	d	140	a	b	c	d	180	a	b	c	d

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