UDC Commentary 21 Code Refresher Quiz Part 4

Instructions

1. Print these pages. **Fee $20**
2. Answer the **Simple questions** that follow mini sections of the code language.
3. Circle the correct answers and transfer the answers to the answer sheets (see last 3 pages).
4. After answering the simple questions you will become familiar with the new code changes.
5. Page down to the last page for the verification form, answer sheets and mailing instructions.

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21.25 Wood Frame Walls

Question: Based on Table 21.25-A, if I have an exterior gable end-wall with a cathedral ceiling that is greater than the stud height allowed, do I have any options other than cutting the studs and installing double top plates?

Answer: Yes, if the allowable height is exceeded, there are three ways of handling this condition:

1. If the maximum allowed stud length is 10 feet, continuous 2" full-depth solid wood blocking could be installed throughout the wall between all studs at the mid-point of the wall height (but in no case exceeding the 10' limitation).
2. The second option would be to install solid wood sheathing material on both the exterior and the interior of this stud wall, covering the entire wall area (under the interior wall finish).
3. Use engineered lumber

Table 21.25-A allows some non-bearing stud walls with heights exceeding the 10' maximum that was previously allowed without structural analysis. Per the table footnote, these non-bearing wall heights are for interior walls only.

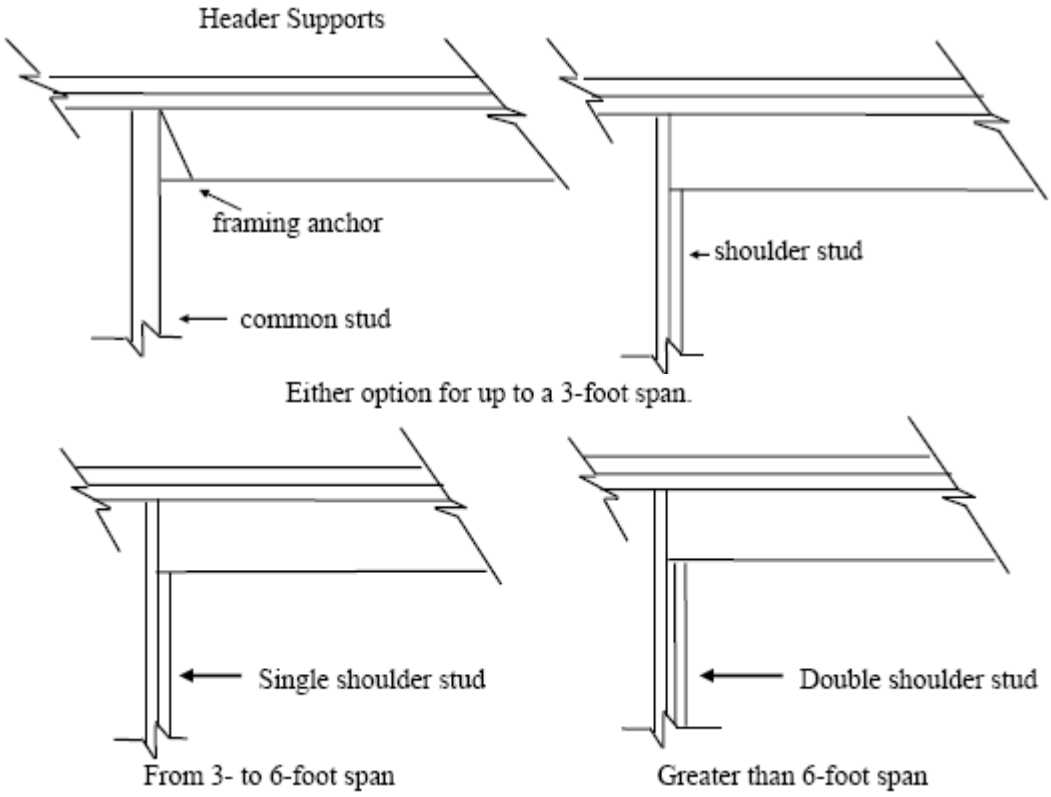
1. Table 21.25-A allows some non-bearing stud walls with heights exceeding the 10' maximum that was previously allowed without structural analysis. Per the table footnote, these non-bearing wall heights are for _____ walls only.
    a. exterior
    b. interior
    c. both a & b
    d. neither a or b
2. If I have an exterior gable end-wall with a cathedral ceiling that is greater than the 10' stud height allowed the studs must be cut to a maximum of 10' tall and double top plates must be installed.
    a. true
    b. false
3. If the allowable stud height is exceeded, which of the following ways of handling this condition is allowed?
    a. If the maximum allowed stud length is 10 feet, continuous 2" full-depth solid wood blocking could be installed throughout the wall between all studs at the mid-point of the wall height (but in no case exceeding the 10' limitation).
    b. Install solid wood sheathing material on both the exterior and the interior of this stud wall, covering the entire wall area (under the interior wall finish).
    c. Use engineered lumber.
    d. all of the above

21.25(3) Wall Opening Framing

Question: What are some examples of acceptable headers for openings in exterior walls?

Answer: Header sizes shown in Tables 21.25-B, C, & D for dimension lumber are acceptable typical headers. For headers exceeding the spans given in Tables 21.25-B, C, and D, see s. 21.22(3) of this commentary for design information.

Comm 21.25(3)(b) prescribes header support minimum standards. The following diagrams are intended to clarify the text. Remember that the "span" is the clear span plus ½ the required bearing area of the header at each end.



4. Load bearing headers greater than ____ feet long require 2 shoulder studs on each end.
    a. 3
    b. 3-6
    c. 6
    d. None of the above
5. Load bearing headers up to 3' long require_____ on each end.
    a. one shoulder stud
    b. a framing anchor
    c. none of the above
    d. both a & b
6. The "span" is the clear span plus ___ the required bearing area of the header at each end.
    a. all
    b. ¼
    c. ½
    d. 3/4

21.25(6) Telescoping Columns

Question: Are telescoping or expandable jacks or columns allowed in the construction of one- and two-family dwellings?

Answer: The use of the telescoping jack post (adjustable height columns) to support beams is not prohibited by the UDC provided they are capable of supporting the imposed loading per Comm 21.25(6)(c)1. The installation shall comply with the manufacturer's installation instructions for spacing, load capacity, maximum height adjustment, beam or footing anchorage and proper method to secure the adjustment device while in service. The adjustable jack should be stamped or bear a sticker which indicates its allowable load. They must be secured at both the top and bottom of the column the same as any other column. Caution should be used on the limitations of screw adjustment permitted for a particular load and even which end is up must follow listing.

Question: What are foundation cripple walls?

Answer: Rules under Comm 21.25(7) were added in 2009 to address the hinge-action caused by placing a wood-framed wall above a partial-height foundation wall of typically masonry or concrete exterior of ground floor or walk-out basement.

7. The adjustable jack should _____ which indicates its allowable load.
    a. be stamped
    b. bear a sticker
    c. have instructions taped to the post
    d. both a & b

8. The use of the telescoping jack post (adjustable height columns) to support beams is prohibited by the UDC provided they are capable of supporting the imposed loading per Comm 21.25(6)(c)1.
    a. true
    b. false

9. The installation of telescoping or expandable jacks or columns shall comply with the manufacturer's installation instructions for _____.
    a. spacing
    b. load capacity
    c. maximum height adjustment
    d. all of the above

10. The installation of telescoping or expandable jacks or columns shall comply with the manufacturer's installation instructions for _____.
    a. beam anchorage
    b. footing anchorage
    c. proper method to secure the adjustment device while in service
    d. all of the above

11. Rules under Comm 21.25(7) were added in 2009 to address the hinge-action caused by placing a wood-framed wall above a partial-height foundation wall of typically _____ exterior of ground floor or walk-out basement.
    a. masonry
    b. concrete
    c. wood
    d. both a & b

12. The installation of telescoping or expandable jacks or columns shall be secured at _____ of the column the same as any other column.
    a. the top
    b. the bottom
    c. both a & b
    d. none of the above

21.25(8) & (9) Wall Bracing

Since the first edition of the Uniform Dwelling Code (UDC) that became effective June 1, 1980, the UDC has required construction that resists lateral wind loads of 20 pounds per square foot of external wall area. This change in the rules on wall bracing incorporate more design and construction specifications in an effort to assure the long-standing performance requirement is met. The additional specifications are based on those contained in the 2006 edition and 2007 supplement of the International Residential Code, developed by the International Code Council.

There are a couple of terms a person will need to become familiar with whether using the interminante bracing method of Comm 21.25(8), alternate bracing method of Comm 21.25(9)(b) or the continuous sheathing method of 21.25(9)(c):

Braced Wall Line: A braced wall line (BWL) consists of wall segments that are off-set no more than 4 ft. from the BWL. Within that braced wall line are braced wall panel(s) that provide resistance to wind loads. The spacing of a BWL shall not exceed 35 ft., or 50 ft. meeting certain additional conditions. [See Comm 21.25(8)(e) and Fig. 21.25-A]

Braced Wall Panel: A braced wall panel (BWP) is an individual bracing component that is installed within a braced wall line. Examples of types of BWP are let-in bracing, wood boards, wood structural panels, structural fiberboard, and gypsum board [See Comm 21.25(8)(b)]. The BWP, unless otherwise specified in the code, shall begin no more than 12.5 ft. from each end and shall be located every 25 ft. on center.

13. A braced wall line (BWL) consists of wall segments that are off-set no more than ___ ft. from the BWL.
    a. 2
    b. 4
    c. 6
    d. 8
14. Since the first edition of the Uniform Dwelling Code (UDC) that became effective June 1, 1980, the UDC has required construction that resists lateral wind loads of ____ pounds per square foot of external wall area.
    a. 10
    b. 20
    c. 30
    d. 40
15. Within that braced wall line are braced wall panel(s) that provide resistance to _____ loads.
    a. live
    b. dead
    c. wind
    d. all of the above
16. The wall spacing distance of a BWL shall not exceed ___ ft.
    a. 12.5
    b. 25
    c. 35
    d. 50
17. The above BWL may be increase to ____ ft. if certain additional conditions are met.
    a. 12.5
    b. 25
    c. 35
    d. 50
18. Unless otherwise specified in the code, a BWP shall begin no more than ____ ft. from each end

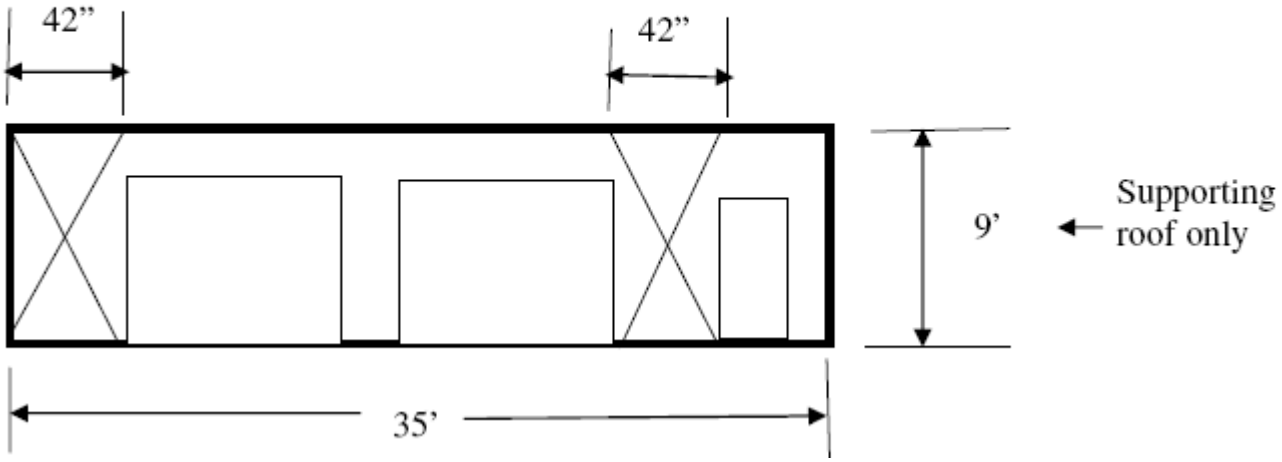
a. 12.5
b. 25
c. 35
d. 50

19. Unless otherwise specified in the code, a BWP shall be located at least ____ ft. on center.
a. 12.5
b. 25
c. 35
d. 50

20 Three terms associated with BWL would be _____?
a. interminante bracing method
b. alternate bracing method
c. continuous sheathing method
d. all of the above

21.25(8) & (9) Wall Bracing

Example: [Effective braced wall panel length = 36" X 2 = 72"] > [0.16 X 35' or 67.2" from Table 21.25-H] OK.

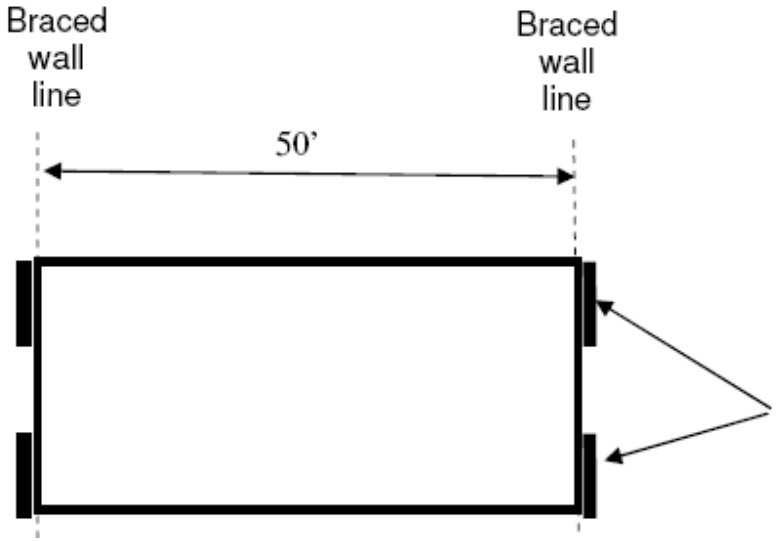


Question: May the latest wall bracing provisions, s. R602.10, set forth in the 2009 edition of the International Residential Code (IRC) be used to meet the wall bracing provisions this code?
Answer: Yes. When using the UDC provision or the 2009 IRC provision, whichever one is used, it shall be used in its entirety. The provision of each may not be mixed and matched. Once the 2009 IRC wall bracing provisions are available for reprint, they will be reprinted in the UDC appendix. For the time being the 2009 IRC can be viewed on the ICC website *www.iccsafe.org*. Select the ICC Store tab and click on the dropdown box eCodes.
Question: Comm 21.25(8)(b)6. requires gypsum boards used as braced wall panels to be fastened at panel edges by nails specified in the fastener table in the appendix spaced no more than 7 inches on center while the fastener table itself specifies a spacing of 4 inches on the edges & 8 inches at intermediate supports. Which one controls?
Answer: The fastener spacing specified in the table is for gypsum sheathing used on the exterior of the building. Gypsum boards used as bracing panels on interior walls may have fasteners spaced 7 inches on center.
Question: May four (4) foot long braced wall panels be used as a substitute where wood and metal let-in bracing is permitted by Table 21.25-G?
Answer: Yes. Let-in bracing may not, though, be used as a substitute for braced wall panels where required by Table 21.25-G.

Question: May I use wood structural panels less than 4 ft. in length in a braced wall line and comply with the intermittent braced wall provisions of the Comm 21.25(8)?
Answer: Yes. As long as the length used meets Table 21.25-G and the "effective" length used to determine panel bracing percentage is as specified in the same. [See example calculation and figure below.]

21. Gypsum boards used as bracing panels on interior walls may have fasteners spaced ___ inches on center.
    a. 6
    b. 7
    c. 8
    d. 4
22. Gypsum boards used as bracing panels on exterior walls may have fasteners spaced ___ inches on edges.
    a. 6
    b. 7
    c. 8
    d. 4
23. Gypsum boards used as bracing panels on exterior walls may have fasteners spaced ___ inches at intermediate supports.
    a. 6
    b. 7
    c. 8
    d. 4
24. When using the UDC provision or the 2009 IRC provision, whichever one is used, the provision of each may be mixed and matched.
    a. true
    b. false

Braced wall lines spaced more than 35 ft. apart and let-in bracing

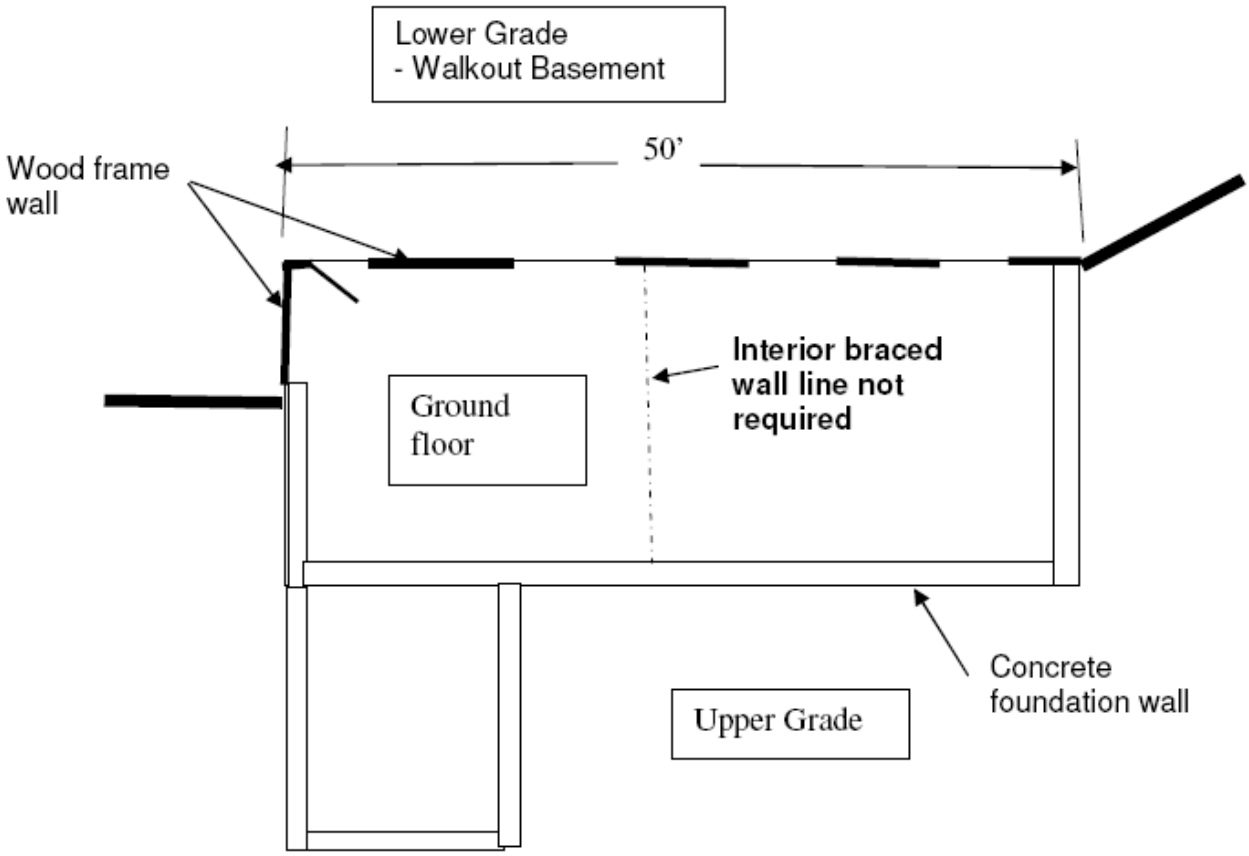


Example: 50'/35' times percent value from Table 21.25-H = Adjusted minimum braced wall panel percentage.

Question: Section Comm 21.25(8)(e)2. refers to Table 21.25-G when determining the "adjusted" percent wall bracing. Is that the right table to reference?
Answer: No. The table that should be referenced is Table 21.25-H.

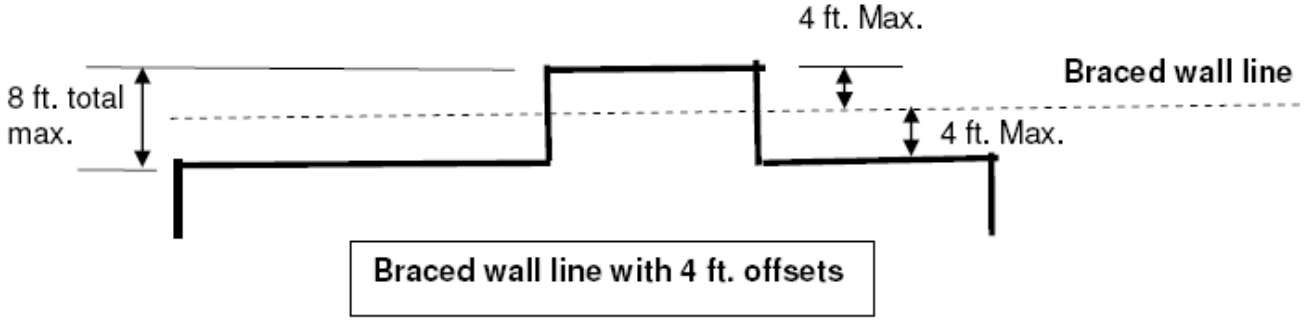
Question: What is the maximum wall height permitted when using the "prescriptive" wall bracing methods of Comm 21.25(8)&(9)?
Answer: 12 feet. See Table 21.25-H, footnote 4, and Table 2.25-I where 12 foot height walls would be permitted. Code compliance for those walls greater that those heights specified in these sections will need to be designed and constructed in accordance with accepted engineering practice.
Question: If my braced wall line spacing is more than 35 ft. and is less than, or equal to 50 ft., may I use wood or metal let-in bracing in those braced wall lines that are spaced more than 35 ft. apart?
Answer: No. Braced wall lines that are more than 35 ft. apart must have the required length of braced wall panels specified in Table 21.25-H increased by a factor of the braced wall line spacing divided by 35. Let-in bracing does not provide an equivalent amount of wind resistance as compared to the added sheathing required by this section.

25. ___ feet is the maximum wall height permitted when using the "prescriptive" wall bracing methods of Comm 21.25(8)&(9).
    a. 8
    b. 10
    c. 12
    d. 14
26. Code compliance for those walls greater that those heights specified in these sections will need to be designed and constructed in accordance with _____.
    a. standard practice
    b. accepted engineering practice
    c. trial and error method
    d. none of the above
27. When braced wall line spacing is more than 35 ft. and is less than, or equal to 50 ft. then it requires _____ in those braced wall lines that are spaced more than 35 ft. apart?
    a. let-in bracing
    b. wood diagonal bracing
    c. braced wall panels
    d. all of the above



Question: The last sentence in footnote 5 of Table 21.25-H refers to Table 21.25-J. Is that the right table reference?
Answer: No. The table that should be referenced is Table 21.25-K.
Question: If I have [diagram above] a walk-out basement with a full-height wood frame exterior wall on one side and the rest of the floor level is below grade, do I need an interior braced wall line if the length of the wall is greater than 35 ft.?
Answer: No. The braced wall lines spaced at 35 ft. are there to provide resistance to wind loads. Since the wall is braced at the top by the floor system and the load is transferred through the floor system to the below grade foundation wall on the opposite side of the ground floor, the lateral resistance to wind for the wall is provided. The exposed exterior walls, though, would still have to meet the wall bracing provisions of Comm 21.25(8) and/or (9).

28. The above diagram needs the required interior braced wall line.
    a. true
    b. false



Question: Must a braced wall line with 4 ft. offsets be in line with an actual building wall line as shown in Fig. 21.25-C?
Answer: No. A braced wall line can be located within actual building wall lines as long as the physical building wall lines are not offset by more than 4 ft. (See Fig. below). This method of determining the braced wall line is consistent with the wall bracing provisions of the 2009 International Residential Code which is an approved engineering analysis as set forth in Comm. 21.25(8)(a), footnote.

29. The above information would allow a sunroom to project out up to 8' and still be within the braced wall line.

a. true
b. false

Question: If I fully sheath my homes have I automatically satisfied the requirements of the wall bracing provisions of the UDC?
Answer: No. The plans will have to clearly show the location and design detail of the braced wall panels, the location and details of required interior braced wall lines and their panel(s), location and details of required corner and 2 ft. endwall return(s), location and details of required tie-downs, etc. as specified in Comm 21.25(8) and (9)(c). Even if the home is fully sheathed, it is suggested that the builder/designer first determine if the intermittent braced wall panel method of Comm 21.25(8) can be used. This would eliminate the need for the 2 ft. endwall returns, special corner construction, the possible need for tie-downs, etc. If you can not comply with the intermittent wall bracing provisions, then take a look at using the continuously sheathed wall bracing method. If there are still wall segments that are too narrow when applying the continuously sheathed method, a person can look at using Fig. 21.25-K, then Fig. 21.25-E and, finally, going to a proprietary wall bracing system.
Question: If I fully sheath my homes, do all of my panels have to have blocking at all the joints?
Answer: No. Only the required braced wall panels need to be blocked. This would also exclude the 2 ft. endwall returns. [See Comm. 21.25(8)(h)1. and 2.]
Question: If I use the continuously sheathed method of Comm 21.25(9)(c) do also need to space braced wall panels no more than 25 ft. on center?
Answer: Yes. Comm 21.25(8)(d) is the general section that also applies to the provisions of Comm 21.25(9)(c). Comm 21.25(9)(c) permits you to use narrower wall bracing panels in a braced wall line.
Question: When determining the braced wall panel length requirements using Table 21.25-J may I use the 4:1 ratio for full-height sheathed wall segments on either side of garage openings?
Answer: Yes. Footnote 2 of the table permits you to do this. This exception, though, is limited to a garage that supports a roof only. It may not have occupied space above it such as a bonus room, attic storage, or a second floor.
Question: Fig. 21.25-G, part (c) refers of sub. (9)(c)6. for garage door corner details. Is that the right section to reference?
Answer: No. The section that should be referenced is sub. (9)(c)5.
Question: Fig. 21.25-G specifies that 8d nails be used while the fastener table in the appendix permits 6d nails for wall bracing panels with a thickness of 5/16" to ½". Is the 6d nail permitted in these corners when use sheathing in that thickness range?
Answer: Yes.

30. When using the 4:1 ratio for full-height sheathed wall segments on either side of garage openings the occupied space above shall not include a _____.

a. bonus room
b. attic storage
c. second floor
d. all of the above

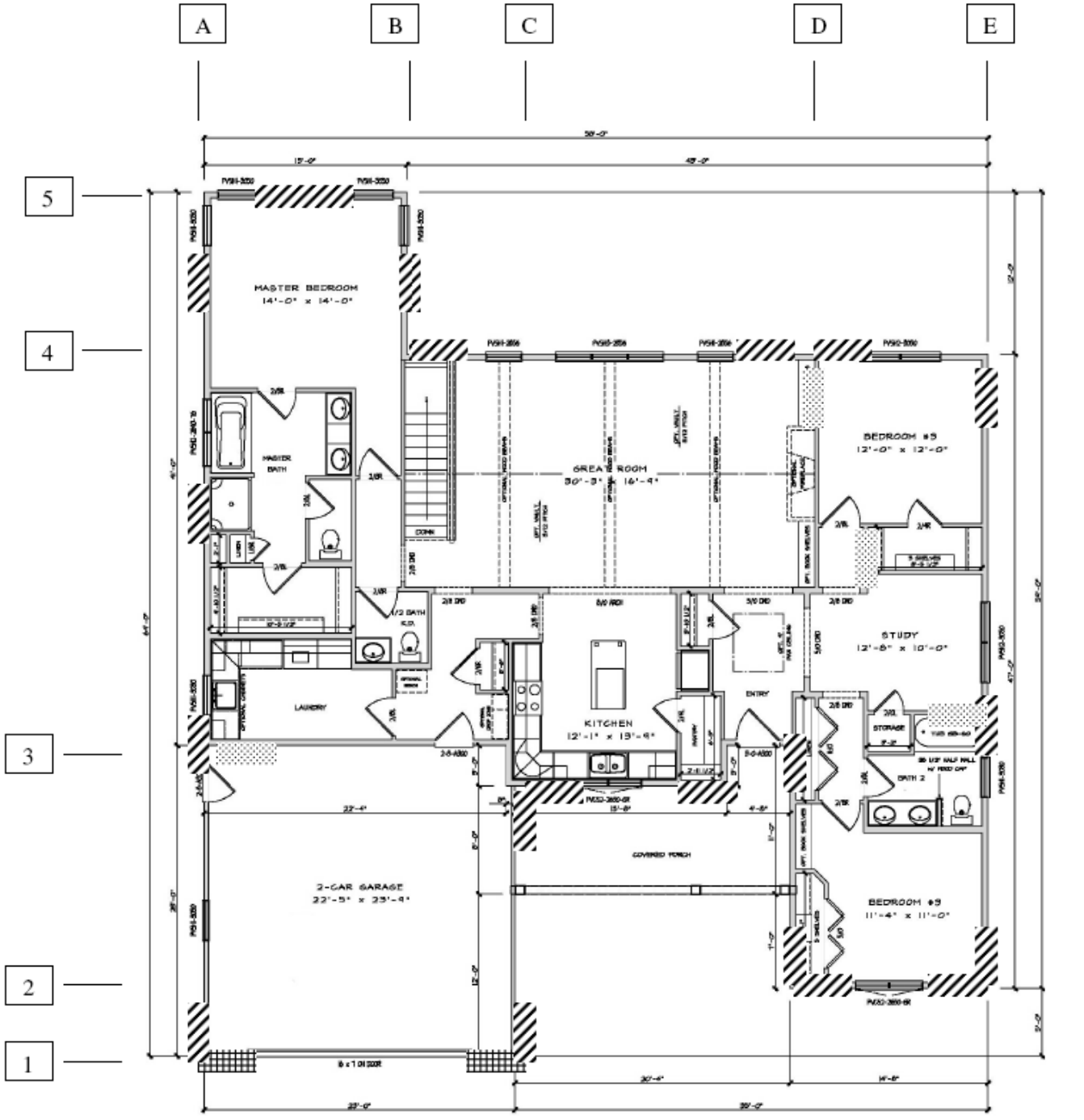
31. 6d nail are permitted in these corners of the braced wall panels when using 5/16" to ½"sheathing.
    a. true
    b. false
32. To be considered fully sheeted all of my panels have to have blocking at all the joints.
    a. true
    b. false

21.25(8)

Continuously- sheathed per s. Comm 21.25(9)(c)5., Fig. 21.25-K, W/2 foot return.

Four Feet of Wood Structural Panel Sheathing or Diagonal Bracing.

Four Feet of Gypsum Wallboard Applied to Both Sides of Wall or Diagonal Bracing.



Building #1
One-Story First Floor

Steps used to determine wall bracing for Bldg. # 1

[Note: This plan and selected bracing solutions were presented at the winter 2009 building inspector association sponsored UDC training sessions. Alternative wall bracing solutions have been provided in this example analysis.]

1. Find braced wall lines in exterior walls using analysis such as the plan north-south and east-west grid line pattern. Braced wall lines may include walls that are offset no more than 4 feet. [Comm 21.25(8)(e)]
2. Check the width of the building to determine whether or not an interior braced wall line is needed. (Spaced no more than 35 ft. apart, or up to 50 ft., with conditions.) [Comm 21.25(8)(e)1. & 2.]
3. Grid Line # 1
    - First check to see if you can comply with the wall bracing provisions of Comm 21.25(8) for 4 ft. wide panels or let-in bracing. This wall does not have the 4 ft. wide space available on either side of the garage door.
    - An option, as identified on the plan, would be to use the continuously sheathed method of Comm 21.25(9)(c), Fig. 21.25-K with 2 ft. returns.
        - o If the garage wall height is 9 ft., this design with the 3" nailing pattern and sheathing overlapping the header permits you to have sheathing on the sides of the garage door opening of 18" minimum. OK
        - o The percent of braced wall panels provided shall be checked for conformance with Comm 21.25(9)(c)5.c., Table 21.25-H. The length required for this wall line would be 23 ft. X 0.16 = 3.68 ft. OK.
        - o Be reminded that the corners at the end of this braced wall line will have to be constructed in accordance with Fig 21.25-G.
    - Another option to consider is Comm 21.25(8)(c)2.c., Table 21.25-G. If the wall height of the garage is 9 ft., braced wall panels could be reduced from 48" to 42" in width. If 42" width is provided, then the continuously sheathed method with 3" nailing pattern and 2 ft. returns would not be needed. This would still meet the percentage requirements of Tables 21.25-G and 21.25-H. [23 ft. X 0.16 = 3.68 ft. The effective length of 36 inches from Table 21.25-G X 2 sides = 72" or 6 ft. > 3.68 ft. OK]
4. Grid Line # 2 - Provide 4 ft. wide panels or let-in bracing within 12.5 feet of each end.
5. Grid Line # 3 - This grid line contains interior and exterior wall segments that are offset no more than 4 ft. from the braced wall line. Since this is considered one braced wall line, braced wall panels or let-in bracing must only be provided within 12.5 ft. of the ends and spaced no more than 25 ft. on center. As this is no more than 35 ft. from grid line #1 and grid line #4 this satisfies the maximum 35 ft. braced wall line spacing requirements. Note: Grid line # 4 was used for this spacing determination instead of grid line #5 as it is that exterior wall that has the majority of the braced wall panels to resist the wind loads.
6. Grid Line # 4 - Provide 4 ft. wide panels or let-in bracing within 12.5 ft. of each end and a maximum of 25 ft. on-center.
7. Grid Line # 5 - Provide 4 ft. wide panels or let-in bracing within 12.5 feet of each end. The plan shows two of 4 ft. wide panels. The code may be met by using just one panel in the center of the braced wall line as this would be within 12.5 ft. of each end. The single panel would also meet the percentage requirements of Table 21.25-H. [15 ft. X 0.16 = 2.4 ft. < 4 ft. provided.]
8. Grid Line A
    - Provide 4 ft. wide panels within 12.5 ft. of each end and a maximum of 25 ft. on-center.
    - Note: The plans show that let-in/diagonal bracing can be used in this braced wall line. After further review and consideration it has been determined that let-in bracing can not be used because this is a braced wall line that exceeds the 35 ft. braced wall line spacing requirement (grid lines A and D) resulting in a need for a check of an added amount of wall bracing required by Comm

21.25(8)(c)2. The use of grid lines B and C could not be considered in that spacing check above, as they do not extend to within 12.5 ft. of each end wall.

• Determine percent wall bracing required. Since the distance between braced walls lines A and D is 46 feet the required percentage would be (46 ft./35 ft. X 0.16) X 64 ft. wall length = 13.5 ft. < 16 ft. provided. OK.

9. Grid Line B - Provide a 4 ft. wide panel within 12.5 ft. of each end.

10. Grid Line C - Provide 4 ft. wide panels within 12.5 ft. of each end. A single panel centered in the braced wall line would meet this requirement. Note, though, that a 2 ft. return may be required at the overhead garage door and the 4 ft. panel at the end would serve a dual purpose.

11. Grid Line D

• This grid line contains interior and exterior wall segments that are offset no more that 4 ft. from the braced wall line. Since this is considered one braced wall line, braced wall panels or let-in bracing must only be provided within 12.5 ft. of the ends and spaced no more than 25 ft. on center.

• Note: The plans show that let-in/diagonal bracing can be used in this braced wall line. After further review and consideration it has been determined that let-in bracing can not be used because this is a braced wall line exceeding 35 ft. braced wall line spacing requirement (grid lines A and D) resulting in a check of an added amount of wall bracing required by Comm 21.25(8)(c)2.

• Determine percent wall bracing required. Since the distance between braced walls lines A and D is 46 feet the required percentage would be (46 ft./35 ft. X 0.16) X 47 ft. wall length = 9.9 ft. < 16 ft. provided. OK.

12. Grid Line E - Provide 4 ft. wide panels or let-in bracing within 12.5 feet of each end and a maximum of 25 ft. on-center.

33. Grid Line C - Provide 4 ft. wide panels within 12.5 ft. of each end. A single panel centered in the braced wall line would meet this requirement. Note, though, that a 2 ft. return may be required at the overhead garage door and the ___ ft. panel at the end would serve a dual purpose.

a. 2
b. 3
c. 4
d. 12.5

34. Grid Line B - Provide a 4 ft. wide panel within _____ ft. of each end.

a. 2
b. 3
c. 4
d. 12.5

35. Grid Line # 2 - Provide ___ ft. wide panels or let-in bracing within 12.5 feet of each end.

a. 2
b. 3
c. 4
d. 12.5

36. Determine percent wall bracing required. Since the distance between braced walls lines A and D is 46 feet the required percentage would be (46 ft./35 ft. X 0.16) X 47 ft. wall length = ____ ft.

a. 10.9
b. 9.9
c. 8.9
d. 13.5

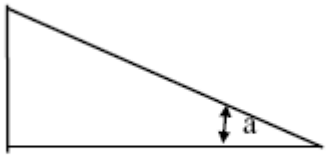
37. Determine percent wall bracing required. Since the distance between braced walls lines A and D is 46 feet the required percentage would be (46 ft./35 ft. X 0.16) X 64 ft. wall length = _____ ft.

a. 10.9
b. 9.9

c. 8.9
d. 13.5

21.27(1)(c) Sloped Roof Snow Loads
This section allows reduction of snow loads on roofs sloped more than 30 degrees. This means a reduction may be taken on roofs with greater than a 7:12 slope. This reduced design snow load may be transmitted down through the structure including any headers or beams. (See table below for examples.) However, it must be remembered that s. Comm 20.02 also requires a 20 PSF wind load acting on the vertical roof projection.

Reduced Snow Load for High Slope Roofs= C_s x Design Snow Load
C_s = [1 - (a - 30)]/40
a = angle in degrees



Rise/Run = Slope = tan a
Arctan(slope) = a

Slope	a	Zone 1 PSF	Zone 2 PSF
7/12	30	40	30
10/12	40	30	22.5
12/12	45	25	18.8
14/12	50	20	15

38. This section allows reduction of snow loads on roofs sloped more than ____ degrees.
a. 20
b. 25
c. 30
d. 35

39. This means a reduction may be taken on roofs with greater than a _____ slope.
a. 5:12
b. 6:12
c. 4:12
d. none of the above

40. This reduced design snow load may be transmitted down through the structure including any_____.
a. headers
b. beams
c. both a & b
d. none of the above

21.27(2) Resistance to Horizontal Wall Thrust from Rafters
Sloping roof rafters will push their supporting walls outward unless this force is properly resisted. Collar ties, which are required in the upper one-third of the rafter, provide some fixity of in the joining of the upper rafter ends, but do not provide much resistance to outward wall thrust. Typically the horizontal wall thrust needs to be resisted by wall ties or ceiling joists or by a ridge beam sized to carry half of the rafter loads.

41. Collar ties are required in the _____ of the rafter.
a. upper half
b. lower 1/3
c. upper one-third

d. all of the above

42. A ridge beam should be sized to carry _____ of the rafter loads.
    a. 1/3
    b. ¼
    c. ½
    d. all

43. Typically the horizontal wall thrust needs to be resisted by _____.
    a. wall ties
    b. ceiling joists
    c. a ridge beam
    d. all of the above

21.28(6) Reroofing

Question: Can re-roofing be done without removing the existing layers of roofing?

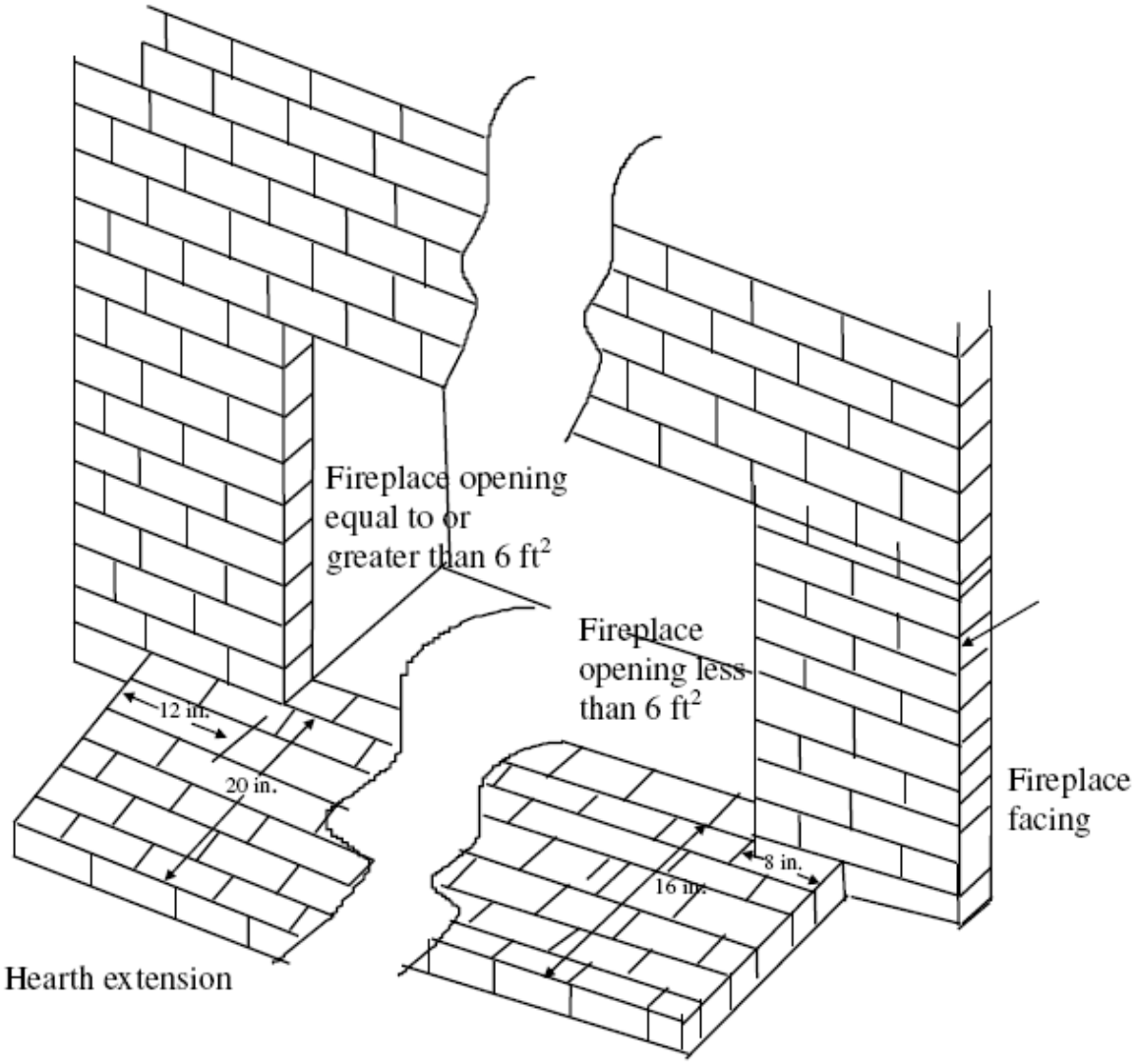
Answer: The subject of the number of layers of roofing materials that can be placed now onto an existing roof system is now addressed in the dwelling code specifically and limited to two [one new layer on top of one existing layer]. However, the design loads of the roof rafter or trusses should not be exceeded. The span tables in the UDC assume dead loads that will typically allow a total of two lightweight roof layers. Additionally, the installation of the roof covering materials would have to be in accordance with the installation requirements.

44. A second layer of roofing can be applied even if the design loads of the roof rafter or trusses are exceeded.
    a. true
    b. false

45. Two lightweight roof layers should have to be installed in a normal workmanship manor and maybe within accordance with the installation requirements only if the job allows.
    a. true
    b. false

46. The span tables in the UDC assume dead loads that will typically allow a total of _____ roof layers.
    a. 3 super light weight
    b. two heavy weight
    c. several medium weight
    d. none of the above

47. The code recommends one new layer of roofing installed underneath the old existing roofing layer.
    a. true
    b. false



Fireplace hearth extension requirements

21.29(6) Hearth Extension

Question: How is the hearth extension measured?

Answer: The hearth or hearth extension is measured from the face of the fireplace opening and not from the front of the firebox, spark screen, or glass doors. The face of the fireplace includes any trim materials provided on the front of the fireplace. Earlier editions of the UDC permitted measurement from the firebox, but as of the 1989 Edition, the measurement is to be taken from the face of the fireplace opening.

48. Fireplaces with openings less than 6 square feet need a hearth extension to extend ___ inches on the sides.

a. 8
b. 12
c. 16
d. 20

49. Fireplaces with openings less than 6 square feet need a hearth extension to extend ___ inches in the front.

a. 8
b. 12
c. 16

d. 20

50. Fireplaces with openings greater than 6 square feet need a hearth extension to extend ___ inches on the sides.

a. 8
b. 12
c. 16
d. 20

51. Fireplaces with openings greater than 6 square feet need a hearth extension to extend ___ inches in the front.

a. 8
b. 12
c. 16
d. 20

21.29(12) Framing Around Fireplaces

Question: This section refers to 21.30(9) which requires 2-inch clearances from fireplace masonry to combustibles. In some cases, the block and brick may cover an entire wall. In such a case, is it necessary to maintain the 2-inch clearance from the entire wall?

Answer: Because of the expected heat dissipation in such an installation, the department will accept the ends of the beams and headers to be placed without a 2-inch clearance if at least 12 inches of solid masonry is also provided between the member and the firebox or chimney flue. If the wood structural member is supported in the masonry, it must be fire cut or a self releasing device must be used as required by s. Comm 21.26(9)(c). Note the requirement for clearances to a fireplace applies only to framing. Other combustible elements such as mantles, trim, and flooring would need to comply with the s. Comm 21.29(11), as well as the hearth requirements of s. Comm 21.29(6). 21.30(7) Flue Liners

Question: If a stainless steel flue liner is used, what gauge stainless steel may be used to line a masonry chimney?

Answer: Stainless steel of 22 gauge or thicker is acceptable. 21.30(9) Fireblocking of Chimneys

Question: The Uniform Dwelling Code requires 2 inches of clearance between combustible headers, beams, rafters, joists and studs and the outside face of an interior chimney (1 inch for an exterior chimney). Does subs. Comm 21.085(1) on fire separation also apply where this rule states "holes around ducts and pipes shall also be fireblocked"?

Answer: Yes. It is the intent for Comm 21.085(1) and 21.30(9)(a) to apply to the 2-inch or 1-inch clearance between the chimney and the structural members. Noncombustible fire blocking material must be used. In addition, insulation is not acceptable for fire blocking metallic chimneys or vents per Comm 21.30(9)(b)&(c) as this would cause “hot spots” to occur and most likely harm them and/or void the manufacturer’s testing.

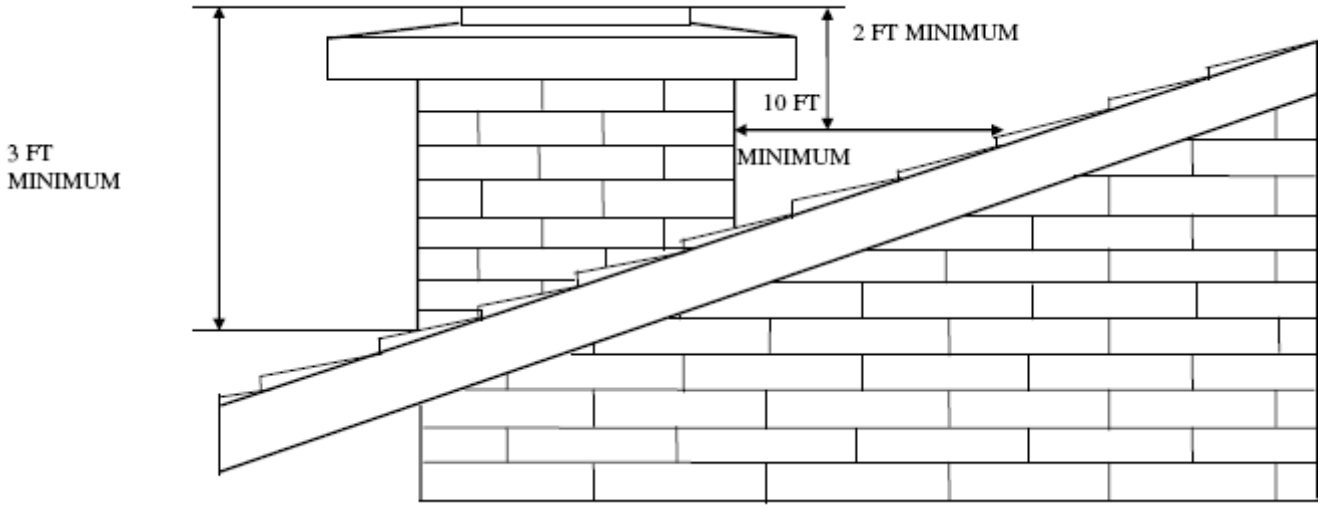
52. _____ gauge stainless steel may be used to line a masonry chimney?

a. 22 or thinner
b. 22 or thicker
c. both a or b
d. none of the above

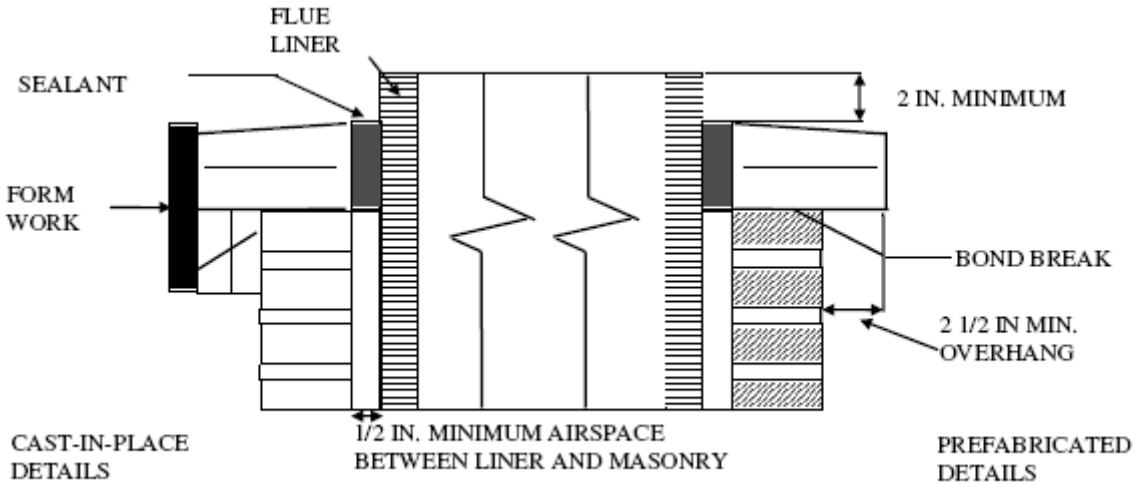
53. The Uniform Dwelling Code requires ___ inches of clearance between combustible headers, beams, rafters, joists and studs and the outside face of an interior chimney.

a. 1
b. 2
c. none of the above
d. both a or b

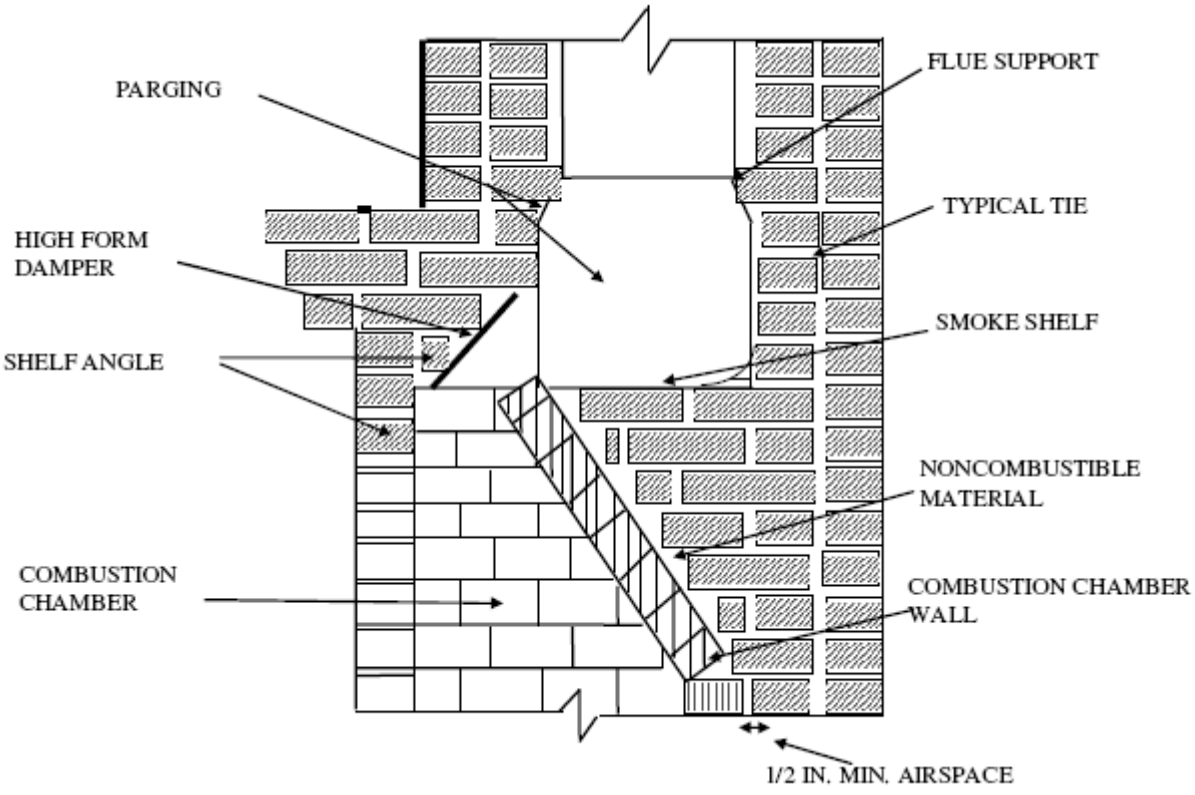
54. The Uniform Dwelling Code requires ___ inches of clearance between combustible headers, beams, rafters, joists and studs for an exterior chimney.
    a. 1
    b. 2
    c. none of the above
    d. both a or b
55. Insulation is acceptable for fire blocking metallic chimneys or vents.
    a. true
    b. false
56. If the wood structural member is supported in the masonry of a fireplace, it must _____.
    a. be fire cut
    b. use a self-releasing device
    c. both a & b
    d. none of the above
57. Because of the expected heat dissipation in such an installation, the department will accept the ends of the beams and headers to be placed without a 2-inch clearance if at least ____ inches of solid masonry is also provided between the member and the firebox or chimney flue.
    a. 8
    b. 10
    c. 6
    d. none of the above



58. The above diagram shows ___' with a 2' minimum height.
    a. 3
    b. 2
    c. 10
    d. none of the above
59. The above diagram shows ___' minimum height.
    a. 3
    b. 2
    c. 10
    d. none of the above



CHIMNEY CAP DETAIL



21.32 Factory-Built Fireplaces

The department conducted an investigation regarding factory-built fireplace installations. As a result of the investigation, it was felt special consideration should be given to two important installation requirements that are especially important to proper operation of such fireplaces.

Per s. Comm 21.32, factory-built fireplaces and their specified chimneys shall be tested and listed by a nationally recognized testing laboratory. Furthermore, the fireplace assembly and chimney shall be erected and maintained in accordance with the conditions of the listing. Currently acceptable testing and listing laboratories for this and other purposes are listed below. Not all will test all classes of appliances.

- Underwriter's Laboratories (UL)
- Electrical Testing Labs of New York (ETL-NY)

- Energy Testing Labs of Maine (ETL-MAINE)
- Canadian Standards Association (CSA)
- Product Fabrication Service (PFS)
- Warnock Hersey

Specific emphasis should be placed on inspection of the construction gap between the front of the fireplace unit and the finish material or fascia. Most, if not all, manufacturers require the gap be filled with noncombustible caulk or equivalent. The fear, although not specifically verified by our investigation, is that hot gases or sparks can migrate out of the fire box through such an opening and eventually cause ignition of the unprotected combustibles behind the fascia. Improper drafting could increase the likelihood of such an occurrence.

Typically the crack between the fireplace and hearth must also be properly sealed against entry of sparks and coals if there is combustible flooring below.

The use of any add-on items should be closely checked as to whether they are listed for that particular fireplace. Be especially suspicious of retrofitted stoves or fireplace inserts which can cause severe problems if the fireplace was not designed for them.

Also, fireplace doors should be checked to verify that they are of a type made by the fireplace manufacturer and approved for installation on that model. Oversize doors could restrict combustion air supply, block air circulation vents or slots that cool the unit or even deflect heat or hot gases laterally into the construction gap between the front of the unit and the surrounding fascia as described above.

In conclusion, all manufacturer's installation requirements should be followed. An inspector is entitled to request a copy of manufacturer's installation instructions, per s. Comm 20.09(4)(b), in order to conduct proper inspections.

Question: Many pre-manufactured fireplace installation instructions require a noncombustible insulating material be placed between the hearth extension finish material and the combustible floor. Is this noncombustible insulating board required by the UDC?

Answer: Indirectly, yes. Section Comm 21.32(1) requires the entire fireplace installation be installed per the manufacturer's listing. The hearth extension design is part of the listing. The insulating board specifications vary between fireplace manufacturers. For example, some “Preway” Models requires either of two of its products, “Preway” HE 36-1 or HE 3624. An alternative material should be equal to 3/4-inch thick noncombustible insulating material with a thermal conductivity of k = 0.55 (Btu)(in)/(hr)(sqft)(oF). As an alternative to k-value, a 3/4-inch noncombustible material with a thermal conductance C = .73 or thermal resistance R = 1.36 is acceptable. Besides the Preway products mentioned, other trade name products such as "Celotex CV 230", "Micore" and "Spec 300" boards may also be acceptable (check kvalues).

21.32 Gas Fireplaces

Question: Are gas-only fireplaces required to have a hearth extension per the UDC?

Answer: No. Gas-only fireplaces are covered by s. Comm 23.04 as a gas appliance and need to be installed per their listing, which typically may not require a hearth extension.

21.32 Factory-Built Fireplace Chimneys

Question: Does the requirement of s. 23.045(3)(a)1., that factory-built chimneys be tested to 2,100^{o}F ("high-temperature" rated) if connected to a solid-fuel appliance, apply to a factory-built fireplace?

Answer: No. Section 23.045 applies to solid-fuel appliances other than those covered by other sections of the code such as masonry and factory-built fireplaces (ss. Comm 21.29 through 21.32). The proper chimney for a factory-built fireplace is the one it was tested and listed with and is normally shipped with the unit. It is possible that such listed fireplace assemblies will have a lower temperature chimney.

60. Gas fireplaces will always require a hearth extension.
    a. true
    b. false

UDC Commentary 21 Part 4 Code Refresher Quiz-Answer Sheet

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

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