UDC Commentary 21 Code Refresher Quiz Part 3

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 2 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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21.17 Drain Tile Materials and Installation Requirements

A properly functioning drain tile system will lower the water table (seasonal or longer term) to the level of the tile installation in the immediate vicinity of the foundation wall.

This is important not only to achieve a relatively dry basement, but to maintain the structural integrity of the home. A saturated soil is not only heavier than dry soil, but it also has less internal soil friction that normally helps restrain lateral soil flow. Therefore, the potential lateral pressures exhibited by saturated soils are significantly greater than well-drained foundation backfill. Also a well-drained soil is less likely to frost heave when frozen.

The tile, backfill, and discharge systems are designed to maximize drainage and minimize potential siltation and overload of the system. A well-graded gravel bed and porous backfill are important for proper drain system operation. Also, per s. Comm 21.12, the grade around the dwelling should slope away to minimize the need for the drain tile to handle surface water surcharge.

This office has received some complaints about sump pump systems operating continuously. Contrary to the complainants' concerns, this is usually evidence of a properly functioning system. The real problem is that groundwater in the area is at a relatively shallow depth, local soils are porous, or both. This results in a high volume of flow. These are conditions that should have been considered in making the decision where to site the building by the owner and builder.

Such situations normally occur in lowland areas, where water tables are perched above poor drainage strata, where surface drainage is bad, or where soils are very porous (fractured limestone, gravels, some sand) that allow easy lateral soil water movement. Zoning laws and subdivision ordinances more appropriately regulate whether certain parcels of land should be developed and what floor elevation is required given these conditions. However, zoning codes may not further regulate construction of the foundation drainage systems.

Care should be taken not to allow sump discharge to cause erosion which would result in sediment being deposited off site.

Wisconsin Plumbing Code in Comm 82.36(8)&(4) should be referenced in design of sumps and discharge to surface where a storm sewer is not available.

The bleeders do not need to be connected to the interior and exterior drain tiles with connectors – they may be butted to the tiles and have piece of membrane material, such as building felt, placed over the gap to kept foreign material out.

Question: What is the proper location for drain tile at the footing level or on the footing?
Answer: Drain tile is to be placed AT the footing level, not setting on the footing, as the code is specific in Comm 21.17(3)(d)5. that the tile must set on 2 inches of coarse aggregate and be covered with at least 12 inches of coarse aggregate.

Question: The code talks about the placement of drain tile on 2 inches of coarse aggregate and being covered with 12 inches of coarse aggregate; but how much coarse aggregate is to be placed on the side of the tile?
Answer: As the code states "covered with at least 12 inches of coarse aggregate," this includes the outside or side exposed to earth of the tile as well as the top. Normally since one side of the tile (connected to the bleeders) is up against the footing, only the top and side needs the 12 inches of cover.

1. The bleeders do not need to be connected to the _____ drain tile with connectors – they may be butted to the tiles and have piece of membrane material, such as building felt, placed over the gap to kept foreign material out.
    a. interior
    b. exterior
    c. both a & b
    d. neither a or b
2. The tile, backfill, and discharge systems are designed to _____ drainage.
    a. minimize
    b. maximize
    c. negate
    d. all of the above
3. The tile, backfill, and discharge systems are designed _____ potential siltation and overload of the system.
    a. minimize
    b. maximize
    c. negate
    d. all of the above
4. A properly functioning drain tile system will _____ the water table (seasonal or longer term) to the level of the tile installation in the immediate vicinity of the foundation wall.
    a. raise
    b. equalize
    c. lower
    d. all of the above
5. The code talks about the placement of drain tile on ___ inches of coarse aggregate.
    a. 2
    b. 6
    c. 12
    d. none of the above
6. The code talks about the drain tile being covered with ___ inches of coarse aggregate.
    a. 2
    b. 6
    c. 12
    d. none of the above
7. Drain tile is to be placed on or above the footing.
    a. true
    b. false
8. Wisconsin _____ Code in Comm 82.36(8)&(4) should be referenced in design of sumps and discharge to surface where a storm sewer is not available.
    a. Plumbing
    b. Building
    c. both a or b
    d. none of the above

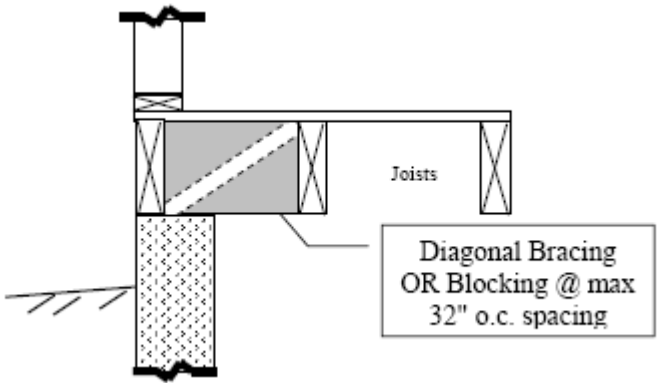
21.18(1) Foundation Wall Lateral Support

Question: Why is lateral restraint required for foundation walls?

Answer: All of the UDC concrete and masonry foundation wall tables are based upon the assumption of lateral support at both the base and top of the walls.

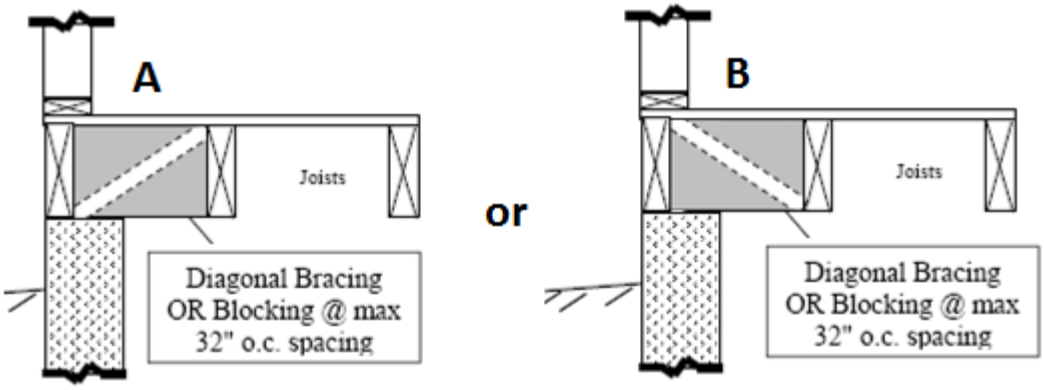
The base of the wall typically is restrained by the floor slab or by the footing with a keyed joint or rebar. The top edge of the foundation wall may be restrained by the first floor through mechanical fastening or ledger blocking. (Ledger blocking alone will not satisfy the dwelling anchorage requirement of s.21.02(1)).

Section 21.18(1)(c)&(d)2.a. requires that lateral restraint shall be continuous from the wall to the plate to the restraining floor system. This will normally require that solid bridging or blocking be installed between the rim joist and adjacent floor joist that run parallel to the foundation wall to transfer the loads on the wall.



Another method would be to furr the inside of the foundation wall with 2 x 4s or an engineered system secured to the joists and bearing against the foundation wall or foundation wall footing.

A special case arises where the fill around a foundation is uneven, as in a walkout basement. In this case the soil pressure on either side of the house is not balanced, thereby possibly causing lateral racking movement of the foundation and floor system. To resist this, additional lateral support by rigid (plywood sheathed) interior cross walls or by pilasters may be needed.



9. Diagonal bracing figure ___ above is correct.
   a. A
   b. B
   c. either a or b
   d. neither a or b

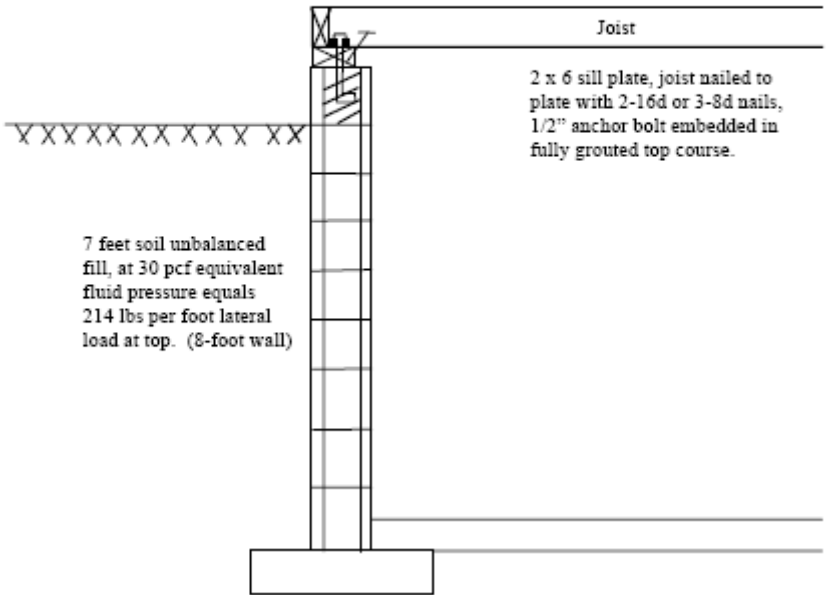
10. Diagonal bracing or blocking installed < ____" on center spacing is required when the floor joist are parallel to the foundation wall.
   a. 24

b. 32
c. 48
d. none of the above

11. Diagonal bracing or blocking installed < ____" on center spacing is required when the floor joist are perpendicular to the foundation wall.
a. 24
b. 32
c. 48
d. none of the above

12. The top edge of the foundation wall may be restrained by the first floor through _____.
a. mechanical fastening
b. ledger blocking
c. gravity
d. both a or b

FOUNDATION LATERAL RESTRAINT



In addition to bolts, other means such as straps or engineered connections may be used to provide lateral restraint to the top of the foundation wall.

21.18(2) Concrete Foundation Walls

Question: Is a 6-inch thick concrete foundation wall acceptable for supporting a 2 x 6 frame wall? The thickness of the frame wall with sheathing, siding, and drywall will exceed the 6-inch foundation wall thickness.

Answer: "In no case shall the thickness of the foundation wall be less than the thickness of the wall it supports." This requirement refers to the width of the structural members of the supported wall. In the wall in question, only the 2 x 6 framing (5.5 inches) are considered structural supporting members, therefore the proposed wall is acceptable.

Question: What does the term nominal wall thickness mean in Table 21.18-B?

Answer: This term was used for when a piece of lumber was used to set the thickness of the wall. That lumber may not have been the full 8 inches in width but had an actual thickness of 7.5 inches at one time. Currently, for softwood lumber of a nominal thickness of 8 inches, the actual thickness can be 7.25

inches. Although it is recommended that the full thickness specified in the table be used, the department will permit a wall to have an actual thickness less than that specified in the table but it may not be reduced by more than ½ inch.

Question: Are there situations where the department will allow unreinforced concrete supporting walls thinner than specified in Table 21.18-B?

Answer: Yes, the code allows 6-inch unreinforced concrete walls to be used provided the fill is within 12 inches of being evenly balanced on both sides of the wall. The top of any concrete slab and the finish grade is used to determine this measurement, such as in an attached garage situation or slab-on-grade dwelling.

Table 21.18-B was developed to assist in determining the maximum height of unbalanced fill that may be placed against a basement wall. The Uniform Dwelling Code has never dealt directly with the issue of wall thickness where the fill is balanced on both sides. During a past code update cycle, the entry in the table for 6-inch walls was deleted because the American Concrete Institute no longer allows unreinforced foundation walls or exterior basement walls less than 7.5 inches thick. However, section 7.1.6.2 of ACI 318.1-1989 allows bearing walls to be a minimum of 5.5 inches thick. With the fill balanced to within the 12-inch condition imposed above, the wall will be considered a bearing wall rather than a foundation or exterior basement wall. A 12-inch variation will still allow flexibility in grading without necessarily mandating the decay protection of wall structural members. Current ACI 318-2005 section 14.5.3.2 empirical design does not permit less than 7.5” thick basement or foundation walls.

Question: What strength of concrete is a "five-bag mix"?

Answer: The strength of concrete is dependent upon a number of factors including the cement-water ratio involved in the mix. A five-bag mix means that 470 lbs. of cement is used per cubic yard of concrete. Without knowing how much water is also used per cubic yard of concrete, the actual design strength of the concrete cannot be determined. Concrete suppliers should have their design mixes tested prior to field use per the American Concrete Institute (ACI) specifications. (See following section.)

13. Nominal wall thickness minimum size can be_____?
    a. full thickness
    b. actual thickness less than that specified in the table but it may not be reduced by more than ½ inch.
    c. normal thickness
    d. all of the above
14. A 6-inch thick concrete foundation wall is acceptable for supporting a 2 x 6 frame wall if the _____?
    a. structural members actual thickness is less than 6”
    b. structural members actual thickness is less than 6” even if the drywall and siding exceed the 6” wall thickness
    c. none of the above
    d. both a & b
15. The code allows 6-inch unreinforced concrete walls to be used provided the fill is within ____ inches of being evenly balanced on both sides of the wall.
    a. 6
    b. 8
    c. 12
    d. none of the above
16. A ___ inch variation will still allow flexibility in grading without necessarily mandating the decay protection of wall structural members.
    a. 6
    b. 8
    c. 12
    d. none of the above

17. A _____bag mix means that 470 lbs. of cement is used per cubic yard of concrete.
    a. 4
    b. 5
    c. 6
    d. 8

Acceptable Practice for Concrete Design
The specified strength of concrete for foundations and footings in one- and two-family dwellings shall be at least 2,500 psi per s. 4.2 of ACI 318.1-89, Plain Concrete Code. The height of 3,000 psi concrete foundation walls shall be governed by Table 21.18-B or alternately, for greater or lesser concrete strengths, through engineered design. It is noted that Table 21.18-B assumes the wall has lateral support at both top and bottom.

18. It is noted that Table 21.18-B assumes the wall has lateral support at _____.
    a. both top
    b. bottom
    c. both a & b
    d. none of the above

21.18(2) & (3)(a) Dampproofing
Question: Could you clarify the UDC requirements for waterproofing of poured concrete foundation walls?
Answer: This section only specifically addresses dampproofing of masonry foundation walls. Section Comm 20.24(2) adopts American Concrete Institute's Standard ACI 318-05 for reinforced and plain concrete. This standard does not mention waterproofing requirements. In summary, there are no requirements for waterproofing of poured concrete walls in new one and two-family dwelling construction.
Question: Does a masonry foundation wall have to be dampproofed before the insulation is applied?
Answer: Yes, this section requires dampproofing of masonry foundation walls of basements. The exterior applied insulation may then be installed. Alternate systems do exist that use a layer of insulation. These need a Wisconsin Building Material Approval or show equivalency with the code's dampproofing requirements.

19. In summary, there are no requirements for waterproofing _____in new one and two-family dwelling construction.
    a. masonry foundation walls
    b. poured concrete walls
    c. both a & b
    d. none of the above
20. The code requires dampproofing of masonry foundation walls of basements. The dampproofing can be applied after the insulation is installed if an alternate system is used. The system needs _____.
    a. a Wisconsin Building Material Approval
    b. to show equivalency with the code's dampproofing requirements.
    c. both a & b
    d. none of the above

21.18(3) Masonry Foundation Walls
In addition to Tables 21.18-B, C, D, or E, designers may use two alternative methods of designing masonry walls.

1. Builder may design a reinforced wall design using structural analysis per s. Comm 21.18(2) and s. Comm 21.02(3)(e) "Concrete Masonry Handbook" or other accepted engineering standard.
2. Builder may design using IBC 2009 of the Commercial Building Code as an engineering standard. This "Empirical Method of Design" could be used as a structural design aid per s. Comm 21.18(2). 21.18(4) Wood Foundations
A copy of the Permanent Wood Foundation Design Specification, ANSI/AF&PA PWF-2007 may be obtained from the: American Forest & Paper Association 1111 19th Street, NW Suite 800 Washington, DC 20036 (202) 463-2700 · info@afandpa.org
The UDC also permits the use of the Permanent Wood Foundations Design and Construction Guide published by Southern Forest Products Association through the Southern Pine Council. You may view and download a copy of this guide for free by accessing their website www.southernpine.com.

21. In addition to Tables 21.18-B, C, D, or E, designers may use _____ alternative methods of designing masonry walls.
    a. 1
    b. 2
    c. 3
    d. 4
22. The UDC also permits the use of the Permanent Wood Foundations Design and Construction Guide published by Southern Forest Products Association through the_____.
    a. Northern Pine Council
    b. Southern Pine Council
    c. Eastern Pine Council
    d. Western Pine Council
23. Builder may design using IBC 2009 of the Commercial Building Code as an engineering standard. This "_____" could be used as a structural design aid per s. Comm 21.18(2). 21.18(4) Wood Foundations.
    a. accepted practice method
    b. empirical Method of Design
    c. practical Method of Design
    d. any of the above

21.203 Garage Floors
Question: Can the garage floor be at the same elevation as the finished floor of the dwelling or is a step or landing required in the garage at a door between the two?
Answer: The code doesn't require an elevation change between the garage floor and the dwelling floor, only that the garage floor slope to the main exterior opening or floor drain. Some local ordinances required a step, but no national building codes have required a step there. In fact, builders who are concerned with handicap accessibility are promoting the same height floor level for garages.
Question: What is the minimum pitch of the garage floor?
Answer: The code is silent on this and doesn't prescribe the degree of pitch, only that it must have a slope to provide drainage. A suggested rule of thumb for concrete flat work is 1/8 inch drop per foot of run.

24. Can the garage floor be at the same elevation as the finished floor of the dwelling?
    a. yes
    b. no
25. Is a step or landing required in the garage at a door between the garage and house?
    a. yes
    b. no

26. he code is silent on this and doesn't prescribe the degree of pitch, only that it must have a slope to provide drainage. A suggested rule of thumb for concrete flat work is ____ inch drop per foot of run.
    a. 1/16
    b. 1/8
    c. ¼
    d. 3/8
27. Handicap accessible homes are not allowed in one and two family construction.
    a. true
    b. false

21.22(1) Floor Joist Design

Question: Does the deflection of floor joists have to be limited to the L/360 as shown in the upper left corner of Table J-1 found in the code appendix.

Answer: There is no requirement in ch. Comm 21 stating what the maximum deflection of structural members must be. Deflection would, therefore, be controlled indirectly through accepted engineering practice. Also, there is no rule in Ch. Comm 21 which specifically states that deflection in Table J-1 is part of the rule. All appendix tables are deemed to meet the minimum standards.

28. Deflection of floor joists must to be limited to the L/360 as shown in the upper left corner of Table J-1 found in the code appendix.
    a. true
    b. false
29. All appendix tables are deemed to exceed the minimum standards.
    a. true
    b. false

22.22(1) Floor Joists and Sill Plates

Question: A wood floor joist system is resting on a sill plate which in turn rests on a hollow concrete masonry foundation. Does the top course of masonry need to have all cores and joints filled with mortar?

Answer: Per s. Comm 21.22(1)(d), the cores of the blocks need not be filled as long as a sill plate is as wide as the block itself is used. If a sill plate is smaller then the width of the block or if a sill plate is not used, then all the cores must be filled.

Question: A wood floor joist system is resting on a sill plate which in turn rests on a concrete foundation wall and is anchored to the foundation wall with anchor bolts required by s. Comm 21.18 (1) (c). What is the minimum width and location of the sill plate relative to the anchor bolt to meet the intent of providing lateral restraint a the top of the foundation wall?

Answer: Per NDS Table 11.5.1A the centerline of the anchor bolt shall be located no less than 2" from the edge of the plate. Per ACI 318 s. D8.2 the edge of the embedded portion of the anchor bolt shall have no less than 1.5" of concrete cover. See Figure 1 below. Note that the example is for solid sawn lumber. Consult with engineered lumber providers to get acceptable installations.

30. The cores of the blocks need be filled even if the sill plate is as wide as the block itself is used.
    a. true
    b. false
31. If a sill plate is smaller then the width of the block or if a sill plate is not used, then all the cores must be filled.
    a. true
    b. false
32. The _____ of the anchor bolt shall be located no less than 2" from the edge of the plate.
    a. edge

b. centerline
c. washer
d. any of the above

33. The edge of the embedded portion of the anchor bolt shall have no less than _____" of concrete cover. See diagram below.
a. 1
b. 1.5
c. 2
d. 3

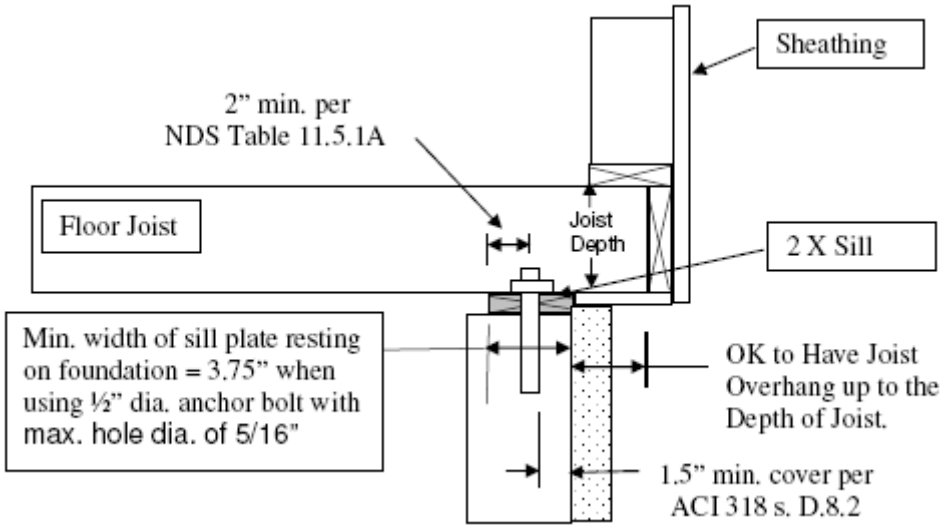


Figure 1
Floor framing perpendicular to foundation wall

Question: I have a wood floor joist system that is installed parallel to the foundation wall. The new energy requirements for basement and perimeter insulation may require up to 2" of insulation on the exterior of the foundation or slab on grade. That will mean that I will have to "cantilever" the sill plate out over the foundation wall further than normal to have my exterior siding line up with the foundation wall now with the thicker insulation on the exterior. How far can I cantilever the sill plate that is located under the floor joists or rim board that is parallel to the foundation wall?
Answer: The sill plate overhang limited to ½ the nominal thickness when rim joist is resting on outer edge. See Figures 2, 2a, 2b and 3 below. Note that these examples are for uniform loading conditions. Concentrated loads may require additional blocking. Also note that the examples are for solid sawn lumber. Consult with engineered lumber providers to get acceptable installations.

34. The sill plate overhang limited to ____ the nominal thickness when rim joist is resting on outer edge.
a. ¼
b. 3/8
c. ½
d. ¾

35. Also note that the examples above and below are for _____.
a. solid sawn lumber
b. engineered lumber
c. both a & b
d. none of the above

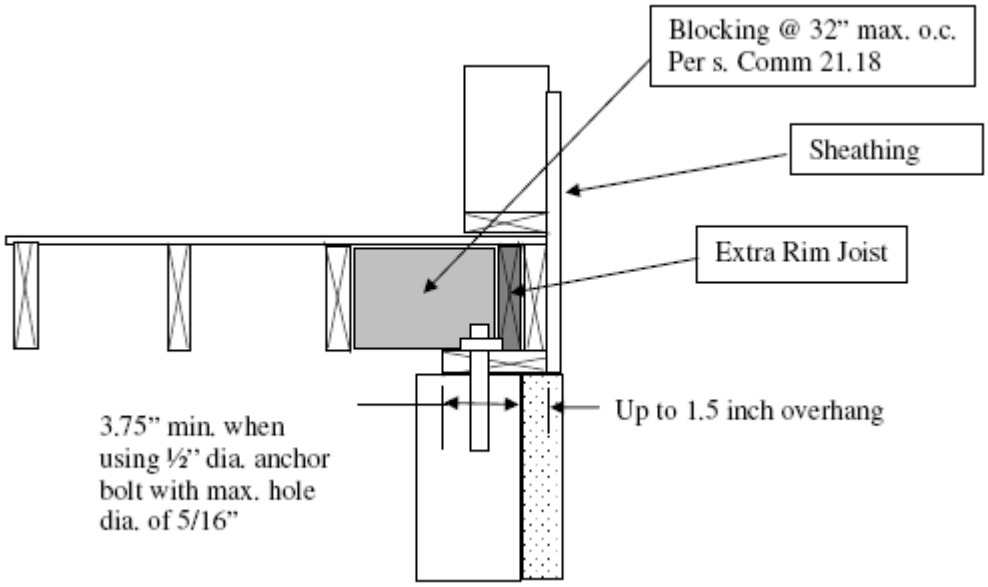


Figure 2
Floor framing parallel to foundation wall (Option 1)

36. The above diagram allows up to a _____" of the floor system to overhang not including the sheathing.
    a. 1
    b. 1 ½
    c. 2
    d. all of the above

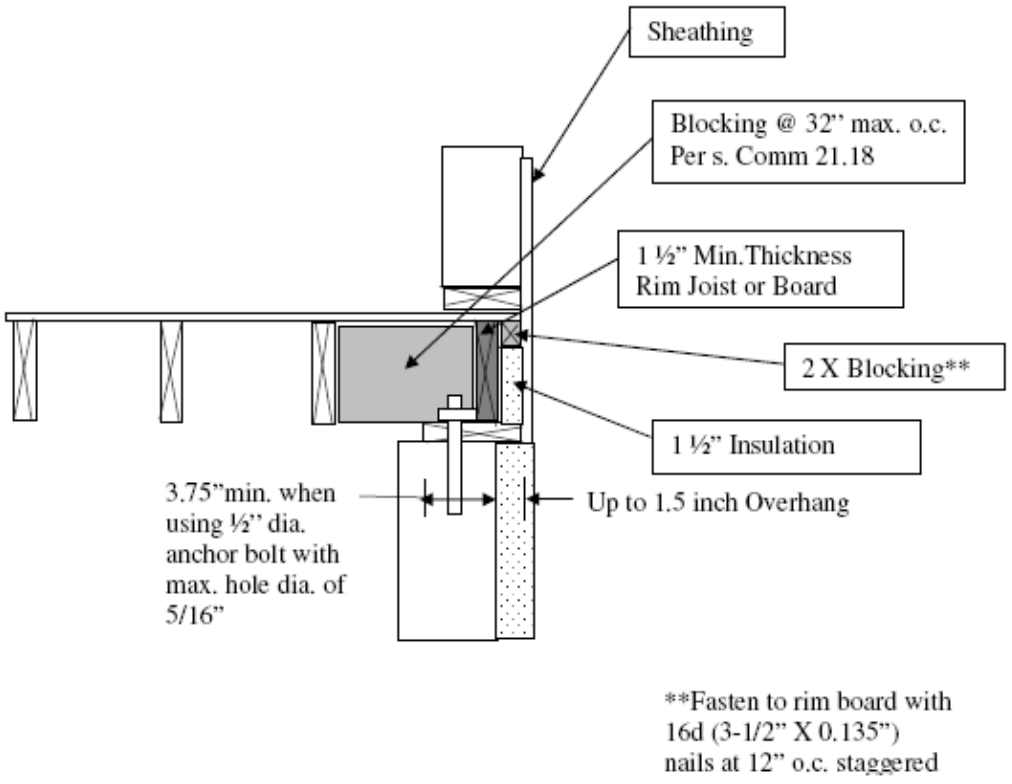


Figure 2a
Floor framing parallel to foundation wall (Option 1a)

37. The above diagram allows up to a _____" of the floor system to overhang not including the sheathing.
    a. 1
    b. 1 ½
    c. 2
    d. all of the above

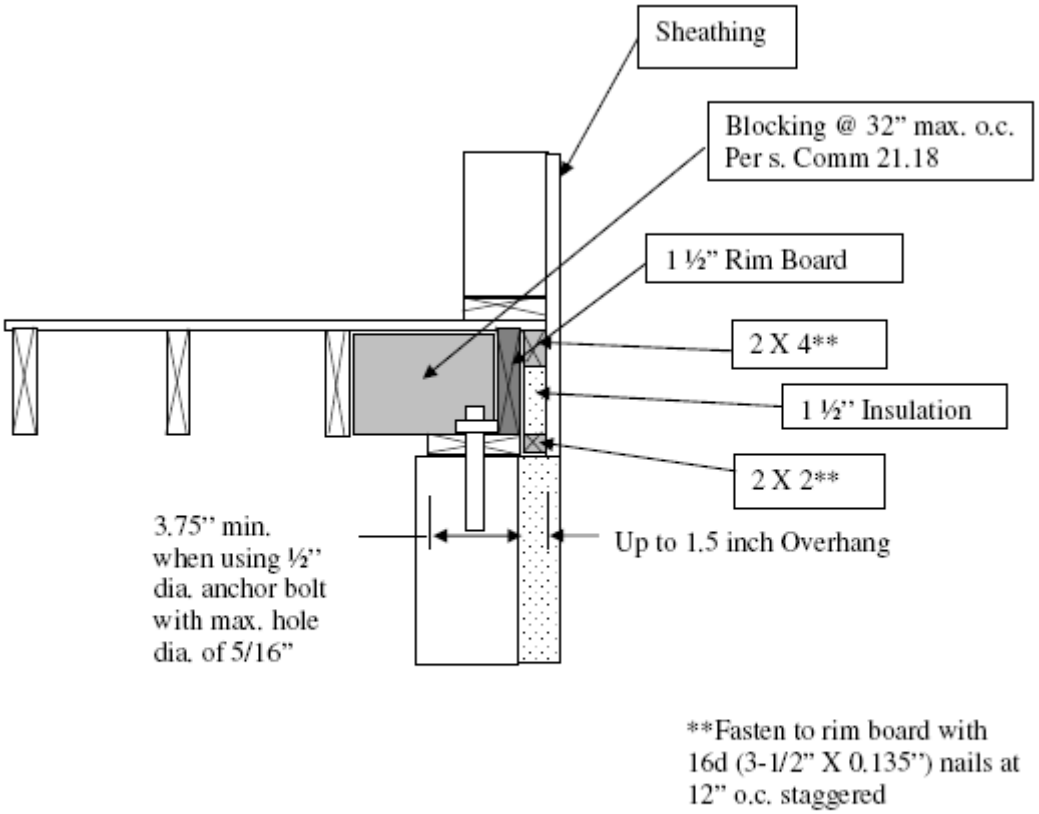


Figure 2b
Floor framing parallel to foundation wall (Option 1b)

38. The above diagram allows up to a _____" of the floor system to overhang not including the sheathing.
    a. 1
    b. 1 ½
    c. 2
    d. all of the above

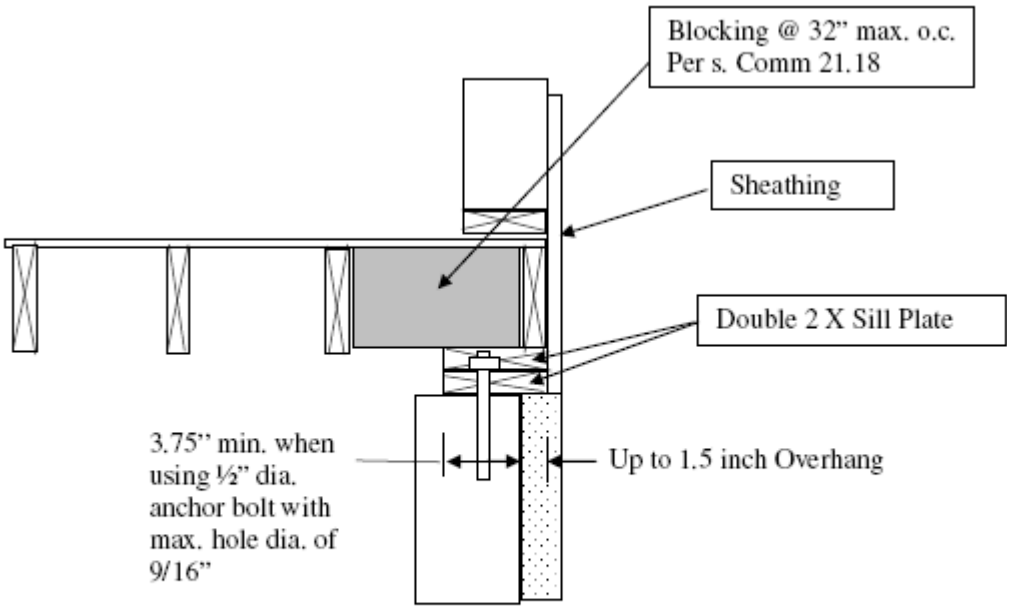


Figure 3
Floor framing parallel to foundation wall (Option 2)

39. The maximum anchor bolt hole diameter allowed is _____?
    a. 5/16
    b. 3/8
    c. ½
    d. 9/16

21.22(3) Steel Beams

Question: Please explain the terminology for steel beams in Table 21.22-A1.

Answer: A-36 steel refers to the strength of the steel. It has an allowable tensile yield strength of 36,000 pounds per square inch. Most beams are now A-50 steel. The designations W and M refer to the standard cross-sectional shapes of steel beams. The term I beam is no longer used, but does describe the general shape of these beams. The major differentiating characteristics of a beam are its top and bottom flanges which are horizontal and the vertical web which separates the flanges. The specific descriptions are: "W" - The top and bottom flanges are parallel to each other. Previously called a wide flange beam in some cases. "M" - Cannot be classified as a W or S shape. Sometimes referred to as a junior I beam previously. It is always best to get the actual shape designation from the suppliers. The two numbers after the shape designation (W, M) provide (1) the overall depth of the beam section and (2) the weight of the beam itself in pounds per lineal foot.

So a beam designated as a W 8 x 15 has a W shape with relatively wide flanges, a depth of 8 inches and weighs 15 pounds per lineal foot.

Question: Table 21.22-A1 gives sizes for beams when conventional framing is used. Table 21.22-A2 gives sizes of wood beams when truss roofs are used. Are there any tables that can be used for steel girders and beams when using truss roofs?

Answer: The correct size of a steel beam can be obtained through use of the Steel Construction Manual published by the American Institute of Steel Construction, Inc. This is the same organization that publishes the standard as adopted in s. Comm 20.24(2). This manual contains tables covering different sizes and shapes of steel beams and specifies the maximum load the beam can carry for a certain span. Table A of the following commentary section (21.22(3)) can be used to determine the actual load on the beam. In order to determine the total load on the beam, the actual load on the beam in pounds per lineal inch as calculated by Table A must be multiplied by the number of inches between the supports.

The table found in Chapter 2 of the Steel Construction Manual can then be used by selecting a beam and then comparing the actual load on the beam calculated with the maximum allowable load of the beam. There are also structural software programs that may be used.

40. A beam designated as a W 8 x 15 has a W shape with relatively wide flanges, a depth of ___ inches.
    a. 8
    b. 15
    c. none of the above
    d. both a & b
41. A beam designated as a W 8 x 15 has a W shape with relatively wide flanges, weighs ____ pounds per lineal foot.
    a. 8
    b. 15
    c. none of the above
    d. both a & b
42. A-36 steel refers to the strength of the steel. It has an allowable tensile yield strength of 36,000 pounds per square _____.
    a. inch
    b. foot
    c. yard
    d. none of the above
43. "___" - The top and bottom flanges are parallel to each other. Previously called a wide flange beam in some cases.
    a. M
    b. W
    c. S
    d. I
44. "M" - Cannot be classified as a W or S shape. Sometimes referred to as a _____ previously.
    a. junior I beam
    b. wide flange beam
    c. none of the above
    d. both a & b

Bearing of floor systems beams & girders [per Comm 21.22(4)(a)2.] or engineered wood products [per Comm 21.22(4)(b)] should be considered to have the load path [from Comm 21.02(1) requirement] followed beyond just the bearing point sizing for adequate load transfer, thus such beams may require additional wall studs directly below them all the way to the foundation below. If such supports have a header in them, typically separate structural analysis must be provided to properly size this header and those supporting jamb columns.

21.22(4) Floor Joist Tails

Question: Why can't the tail ends of joists overlap by more than the depth of a floor joist?

Answer: The reason for the requirement is to prevent potential subfloor uplift from the tail end reaction to the deflection of the joist span. This could be more of a problem at the center beam of a house in which the clear span roof trusses are used and there is no bearing wall resting on the floor joist tail ends.

Question: Can wood shims be used under a steel beam or under a steel column for minor dimensional adjustments? What about pressure treated lumber?

Answer: Maybe, but not likely, since the shim material used would need a compressive strength equal to or greater than the loads imposed by the typically highly loaded steel members. If structural calculations are lacking on this point, then steel shims would be required.

45. The reason for the requirement is to prevent potential subfloor uplift from the tail end reaction to the deflection of the joist span. This could be more of a problem at the center beam of a house in which the _____ roof trusses.

a. center bearing
b. clear span
c. none of the above
d. both a & b

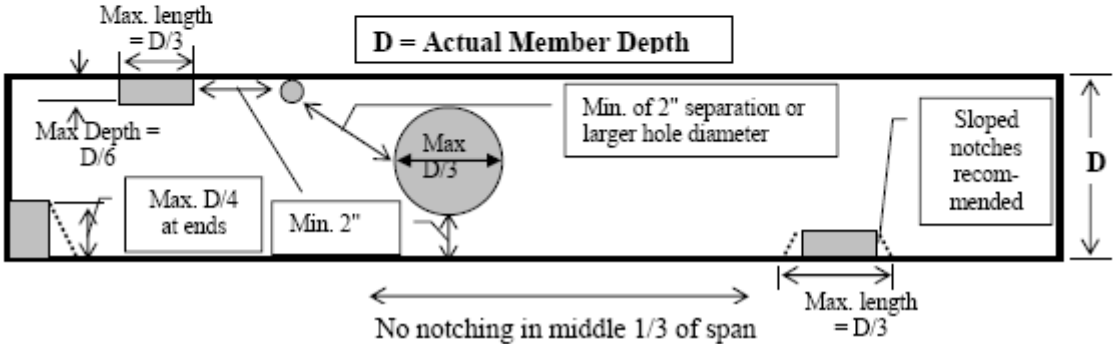
46. Tail ends of joists overlap by more than the depth of a floor joist.

a. true
b. false

47. If structural calculations are lacking on this point, then _____ shims would be required under a steel beam.

a. wood
b. composite
c. steel
d. all of the above

Holes & Notches in Sawn Joists and Rafters (D = Actual Member Depth)			
Member Size	Maximum Hole Diameter or Notch Length = D/3	Maximum Edge-Hole Diameter or Notch Depth (except at ends) = D/6	Maximum End Notch = D/4
2x6	1-3/4"	7/8"	1-3/8"
2x8	2-3/8"	1-1/4"	1-7/8"
2x10	3"	1-1/2"	2-3/8"
2x12	3-3/4"	1-7/8"	2-7/8'



48. Notching is allowed in the _____.

a. middle 1/3
b. first 1/3
c. none of the above
d. both a & b

49. Required minimum separation of _____ is required between round holes.

a. 2”
b. largest hole
c. hole size only
d. both a & b

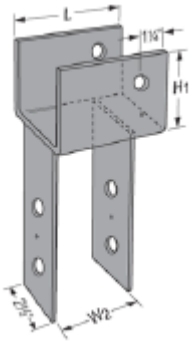
50. A 3” PVC waste or vent pipe can be installed in a _____ sawn lumber floor joist.

a. 2 x 10
b. 2 x 12
c. none of the above
d. both a & b

51. D = the _____ member depth?
    a. nominal
    b. average
    c. actual
    d. all of the above
52. The above chart includes?
    a. joists
    b. rafters
    c. wall studs
    d. both a & b

21.22(3) Beam Lateral Restraint

Deeper than 11.25" wood beams at supporting columns shall be provided with lateral restraint by means of a saddle or other approved connection. A saddle supports the beam on the bottom, but also allows through-connection of fasteners into the side of the beam.



53. An 11 7/8" wood beam would require a _____.
    a. saddle
    b. other approved connection
    c. none of the above
    d. both a & b
54. A saddle supports the beam on the bottom, but also allows through-connection of fasteners into the _____ of the beam.
    a. bottom
    b. side
    c. none of the above
    d. both a & b

21.22(6) Deck Cantilevers

Question: This section allows a 2-foot cantilever that supports the wall and roof above without the need for calculations. Again, without project specific calculations being required, how far may a deck be cantilevered when it only supports its own floor load?

Answer: In the case of the code allowed 2-foot cantilever, the floor assembly is supporting its own known uniform floor load and a point load from the roof system of an unknown span. Therefore it is very conservative. In the proposed case of a cantilevered deck supporting only its own floor load, the loads are all known, therefore a more liberal treatment is possible. So theoretically, the cantilever could be one-half of the simple beam span. This would also parallel the requirement of s. Comm 21.22(6)(b) that the cantilever be anchored back two times the overhang. However, the owner may be unhappy with the deflection at the end of the deck, since for a given span, the deflection for a cantilever is about ten times that of a simple span.

Besides the above analysis, the designer should evaluate the need for any uplift restraint on the backspan at the most critical loading where the cantilever has full live plus dead loads, while the backspan is under dead load only.
The deflection, non-uniform loading and uplift concerns, should be addressed by the designer. Also, the designer must confirm the assumption that the backspan joist is adequate for the simple span loading case before using the above formula to determine the cantilever length.

55. This would also parallel the requirement of s. Comm 21.22(6)(b) that the cantilever be anchored back _____ times the overhang.
    a. one
    b. two
    c. three
    d. one and one half
56. The deflection for a cantilever is about _____ times that of a simple span.
    a. one
    b. ten
    c. three
    d. one and one half

21.22(7) Joists Bearing Over Window Openings
In the absence of a wall header, the requirements of Comm 21.22(7) apply to floor joists that end above a window or other wall opening. This is typically the case for basement windows. Therefore, either framing anchors or a ledge strip, including a sill plate, is required for proper bearing for any joists over 8 feet long.

57. Framing anchors or a ledge strip, including a sill plate, is required for proper bearing for any joists over ___ feet long.
    a. 4
    b. 6
    c. 8
    d. 10

21.24 Exterior Covering
Question: Must the siding or finished surface material be in place before insulation can be installed?
Answer: No, so long as it is "protected" from the elements which could cause excessive moisture in the finished walls. This "protection" could be any of the materials above. You should note that most building paper is listed by the manufacturer to not be directly exposed to weathering (sunlight & rain) for extended periods, unless it will be replaced before finish siding materials are installed over it. Also note that this requirement does include gable & dormer walls, not just walls which are part of the building thermal envelope [for which building paper may be used to meet infiltration resistance requirements of Comm 22].
21.24 (4) Water Resistive Barrier (Drainage Plane)
Specific standards for water-resistive barrier materials are now found in the code. These include material compatibility, performance and application requirements, as well as minimum protection or flashing of most penetrations of the barrier materials.

58. Required exterior covering doesn't include gable & dormer walls that are not part of the building thermal envelope.
    a. true
    b. false
59. Building paper must always be replaced before finish siding materials are installed over it.

a. true
b. false

60. These include material compatibility, performance and application requirements, as well as _____ protection or flashing of most penetrations of the barrier materials.
a. maximum
b. minimum
c. possible
d. none of the above

UDC Commentary 21 Part 3 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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