

Level III

Chapter 3

Worksheet

1. What is the appropriate occupancy classification for a university building constructed to accommodate offices, classrooms and non-hazardous research laboratories?
 - a. Group I
 - b. Group B
 - c. Group E
 - d. Group H

2. A reformatory is constructed with Use Condition 1 Restraint. What is the occupancy classification?
 - a. Group B
 - b. Group R
 - c. Group M
 - d. Group I-2

3. A restaurant with an occupant load of 86 people shall be classified as Group _____.
 - a. M
 - b. A-2
 - c. A-1
 - d. B

4. Child care facilities which accommodate 105 children less than 2.5 years old, and who stay less than 24 hours per day, shall be classified as Group _____.
 - a. E
 - b. B
 - c. R
 - d. I-4

5. Dormitory facilities shall be classified as Group _____?
- a. R-1
 - b. E
 - c. R-2
 - d. B
6. Dry cleaning establishments which utilize a liquid solvent having a flash point at or above 300° F are a _____ Occupancy.
- a. F-1
 - b. B
 - c. F-2
 - d. Hazardous
7. Class 3 Oxidizers that are pressurized at more than _____ psi are classified as _____ Occupancies.
- a. 15, H-2
 - b. 20, H-2
 - c. 30, H-5
 - d. 15, H-3
8. A chemical that has a median lethal dose of more than 200 milligrams per kilogram is a (an) _____ chemical.
- a. organic peroxide
 - b. oxidizer
 - c. pyrotechnic
 - d. toxic

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Chapter 3

Answer Key

1. B 304.1
2. B 308.4.1
3. B 303.1
4. D 308.5.2
5. C 310.1
6. D 307.5
7. A 307.4
8. D 307

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Chapter 4

Worksheet

1. What is the occupancy classification of an open parking garage and what types of construction are permitted?
 - a. Group U, Type I
 - b. Group S-2, Types I, II, IV
 - c. Group S-1, Types I, II, III
 - d. None of the above

2. In Group I-2, smoke barriers shall be provided to subdivide every story used by patients and to divide other stories with an occupant load of _____ persons into at least _____ smoke compartments.
 - a. 49 or more, 2
 - b. 50 or more, 1
 - c. 50 or more, 2
 - d. 100 or more, 2

3. In Group H, ducts conveying vapor or fumes having flammable constituents less than _____ percent of their lower flammability may pass through other spaces.
 - a. 25
 - b. 20
 - c. 30
 - d. 50

4. Plastic signs in a mall shall not exceed _____ percent of wall area facing mall and shall be located a minimum distance of _____ inches from adjacent tenants.
 - a. 18, 20
 - b. 12, 20
 - c. 20, 18
 - d. 30, 12

5. Without exception, atrium spaces shall be separated from adjacent spaces by a _____-hour fire barrier wall.
- a. 1
 - b. 2
 - c. 3
 - d. 4
6. Emergency power loads in an underground building shall be activated within _____ seconds of failure of the normal power supply.
- a. 20
 - b. 15
 - c. 60
 - d. 10
7. The occupant load factor in a covered mall building is not required to be less than _____ and shall not exceed _____.
- a. 50, 40
 - b. 30, 50
 - c. 50, 30
 - d. 60, 30
8. The maximum travel distance within a mall to an exit shall not exceed _____ feet.
- a. 250
 - b. 300
 - c. 200
 - d. 150
9. The minimum mall width is _____ feet.
- a. 30
 - b. 25
 - c. 40
 - d. 20

10. A high-rise building shall have an on-premises fuel supply sufficient for not less than _____ full-demand operation of the system.
- a. 90 minutes
 - b. 1 hour
 - c. 45 minutes
 - d. 2 hours
11. A Group R-4, adult day care requires at least one _____ fire extinguisher shall be provided per floor with a maximum of _____ feet travel distance to the extinguisher.
- a. 3-A:10 - B:C, 40
 - b. 2-A:20 - B:C, 40
 - c. 2-A:10 - C:C, 40
 - d. None
12. In drying rooms, overhead heating pipes shall have a clearance of not less than _____ inches from combustibles in the dryer.
- a. 1½
 - b. 3
 - c. 2
 - d. 1
13. Covered mall buildings exceeding _____ square feet shall be provided with standby power systems.
- a. 50,000
 - b. 40,000
 - c. 35,000
 - d. 45,000
14. H-5 facilities shall be provided with mechanical exhaust ventilation throughout the fabrication area at the rate of not less than _____ of floor area.
- a. 2 cubic feet per min per sq ft
 - b. 1 cubic foot per min per sq ft
 - c. 3 cubic feet per min per sq ft
 - d. none of the above

15. The minimum width of an exit passageway from a mall shall be _____ inches.
- a. 72
 - b. 66
 - c. 48
 - d. 54
16. Detached storage of Class III organic peroxide is required when the quantity of material exceeds _____.
- a. 25 lbs
 - b. 50 lbs
 - c. 50 tons
 - d. 25 tons
17. In an H-5 detached fabrication area, the maximum quantity of a pyrophoric gas shall not exceed _____ cubic feet.
- a. 3000
 - b. 2500
 - c. 4000
 - d. 2000
18. In H-5 single fabrication area, the maximum quantity of a pyrophoric gas shall not exceed _____ cubic feet at NTP.
- a. 10,000
 - b. 7,000
 - c. 8,000
 - d. 9,000
19. A 400 square feet HPM room shall be separated from other areas by not less than a _____-hour fire barrier.
- a. 2
 - b. 1
 - c. 3
 - d. no rating if sprinklered

20. An aircraft hangar 19 feet from a property line shall have a fire-resistance rating of not less than _____.
- a. 2 hours
 - b. 3 hours
 - c. 1 hour is sprinklered
 - d. no rating

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Chapter 4

Answer Key

1. B 406.3.3
2. C 407.4
3. A 414.3 EXCEPTION
4. C 402.15.1, 402.15.3
5. A 404.5
6. D 405.10
7. B 402.4.1.2
8. C 402.4.4
9. D 402.5.1
10. D F 604.2.14.1.1
11. D 422.3
12. C 417.2
13. A 402.14
14. B 415.8.2.6
15. A 402.4.5.1
16. C TABLE 415.3.2
17. D TABLE 415.8.2.1.1 NOTE E
18. D TABLE 415.8.2.1.1 NOTE D
19. A 415.8.5.2.1

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Chapter 5

Worksheet

1. The allowable area for a business (B), type V-B construction, unsprinklered, one story building built on the property line is _____ sq. ft.
 - a. 6,000
 - b. 12,000
 - c. 9,000
 - d. 18,000

2. What is the maximum height of an educational occupancy of type IV construction and is unsprinklered?
 - a. 80 ft.
 - b. 90 ft.
 - c. 65 ft.
 - d. 55 ft.

3. The maximum area limit of a two-story residential (R1) building, Type III-B unsprinklered, is _____ square feet.
 - a. 12,000
 - b. 16,000
 - c. unlimited
 - d. None of the above

4. The maximum area per floor of a Group I-2 building, Type II-B, two-story, sprinklered is _____ square feet.
 - a. 11,000
 - b. 22,000
 - c. unlimited
 - d. None of the above

5. Height modifications are allowed in all occupancies except ____.
- a. Business
 - b. Mercantile
 - c. Hazardous
 - d. Allowed in all of the above occupancies
6. What is the allowable area for an F-1 occupancy with Type III-B construction and no area increase?
- a. 12,000 sq. ft.
 - b. 14,500 sq. ft.
 - c. 19,000 sq. ft.
 - d. 23,500 sq. ft.
7. The clear height above and below the mezzanine floor construction shall not be less than _____.
- a. 6 ft., 8 inches
 - b. 7 ft., 0 inches
 - c. 7 ft., 6 inches
 - d. 8 ft., 0 inches
8. A Group R-1 occupancy of Type III-B construction, 3 stories in height, sprinklered has an allowable height of _____.
- a. 55 feet
 - b. 65 feet
 - c. 75 feet
 - d. 60 feet

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Chapter 5

Answer Key

1. C TABLE 503
2. C TABLE 503
3. B TABLE 503
4. B 506.3
5. C 504.2, 506.3
6. A TABLE 503
7. B 505.1
8. A 504.2

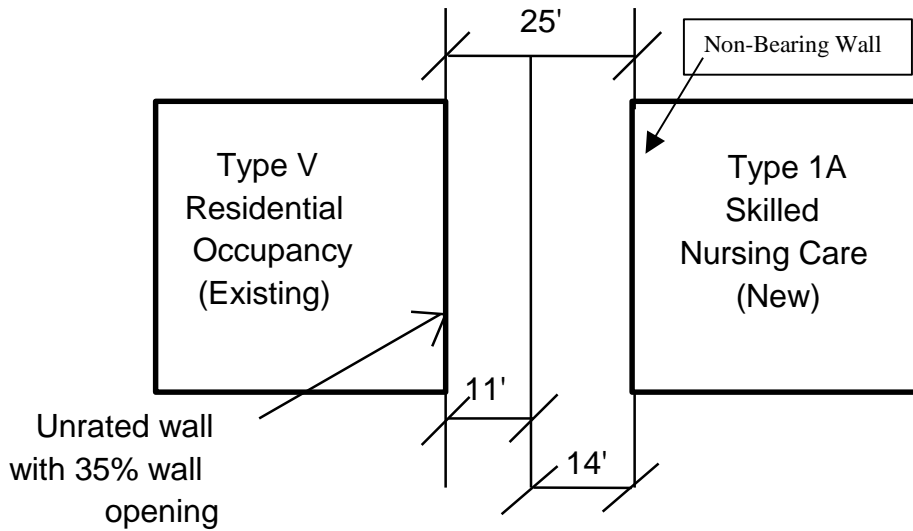
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Chapter 6

Worksheet #1

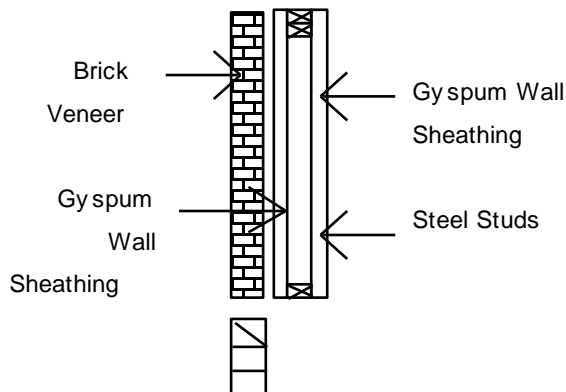
Table 601 & 602 Examples

1. Given the following:



What is the required rating of the non-load bearing wall of the skilled nursing center?

2. Given the following exterior wall section, indicate the type(s) of construction to which it applies.



3. A two story Type II-B 1 hr. protected school is proposed. During value engineering, a fire retardant treated roof system is presented to you for approval. Is this roof system acceptable?
 - a. yes
 - b. no

4. Partitions dividing portions of offices occupied by one tenant only, and which do not establish a corridor serving an occupant load of _____ or less may be constructed of fire-retardant treated wood up to 6 feet in height.
 - a. 10
 - b. 30
 - c. 50
 - d. 100

5. Roof framing splice plates in type IV construction shall be no less than _____ inches in thickness.
 - a. 3
 - b. 4
 - c. 5
 - d. 6

6. What is the lowest fire resistive rating for a beam that supports only a roof that is 25 feet above the floor below in a mercantile occupancy of type I-A construction?
 - a. 0
 - b. 1
 - c. 1.5
 - d. 2

7. A type I-B building with a girder supporting a floor only shall have a fire resistive rating of _____ hour(s).
 - a. .5
 - b. 1
 - c. 1.5
 - d. 2

8. Given a Type I building, four stories in height with 30 feet of open space to property lines; what is the minimum type of material for non bearing walls?
- a. Non-combustible
 - b. Fire-retardant
 - c. Steel studs
 - d. Conventional lumber
9. Given a two-story, Type I building; wood trusses can be used if _____.
- a. of conventional lumber
 - b. of fire retardant lumber
 - c. of non-combustible materials
 - d. spaced 2 feet on center
10. Fire retardant partitions can be used in _____.
- a. Type V construction only
 - b. All types of construction
 - c. Type IV only
 - d. Type I & II construction only

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Chapter 6

Answer Key #1

1. 1 HOUR TABLES 601 & 602
2. TYPE I, II & IV CONSTRUCTION
3. A TABLE 601, NOTE C
4. B 603.1(8)
5. A 602.4.3
6. A TABLE 601 NOTE C
7. D TABLE 601
8. B 603.1
9. B TABLE 601, NOTE C (3)
10. B 603.1.8

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Chapter 7

Worksheet

1. A solid precast concrete wall with carbonate aggregate 5.7 inch thickness shall have a fire resistance rating of _____.
 - a. 1.5 hours
 - b. 2 hours
 - c. 3 hours
 - d. 1 hour

2. A reinforced floor with a minimum thickness of 4 inches and siliceous concrete has a fire resistant rating of _____.
 - a. 1 hour
 - b. 2 hours
 - c. 3 hours
 - d. none of the above

3. A restrained concrete prestressed beam of sand lightweight concrete has a prestressed beam cover minimum of _____ inches for reinforcement. The beam is 2 hour rated.
 - a. $\frac{3}{4}$
 - b. $1 \frac{1}{2}$
 - c. 2
 - d. 1

4. For fire resistance rating of an exterior wall with more than _____ feet of horizontal separation, the fire shall be assumed to occur on the interior side only.
 - a. 3
 - b. 4
 - c. 5
 - d. 6

5. 5/8-inch Type X gypsum wallboard has a ____ minute time assigned to finish materials on the fire-exposed side of wall.
- a. 25
 - b. 40
 - c. 30
 - d. 45
6. In heat transfer, ____-ply built-up roofing contributes ____ minutes to the fire resistance rating.
- a. 2, 10
 - b. 3, 15
 - c. 2, 15
 - d. 3, 10
7. Where openings in the wall are not protected as required by Section 714.2, the minimum dimension of columns required to have a fire-resistance rating of 3 hours or less shall be ____ inches.
- a. 8
 - b. 6
 - c. 12
 - d. 10
8. The equivalent thickness of completely filled hollow concrete masonry is the actual thickness of the unit when loose-fill materials are _____.
- a. gravel
 - b. pea gravel
 - c. A and B
 - d. None of the above
9. Gypsum wallboard and gypsum lath applied to concrete masonry shall be secured to steel furring members spaced not more than _____ inches?
- a. 12
 - b. 24
 - c. 16
 - d. 6

10. For fire resistance ratings of 2 hours or less, column covers fabricated from _____ - inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints.
- a. 0.0269
 - b. 0.0300
 - c. 0.0250
 - d. 0.0400
11. What is the opening fire-protection rating required for a 6 story office building stair shaft?
- a. 1 hr
 - b. 1½ hr
 - c. 3 hr
 - d. 20 min
12. Access openings for refuse chutes shall be protected by opening protective rated at not less than _____.
- a. 4 hours
 - b. 1 hour
 - c. ¾ hours
 - d. 20 minutes
13. Openings into chutes shall not be located in exit access corridors.
- a. True
 - b. False

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Chapter 7

Answer Key

1. C TABLE 721.2.1.1
2. D TABLE 721.2.1.1
3. B TABLE 721.2.3 (5)
4. C 721.2.1.4.3 EXCEPTION
5. B TABLE 721.2.1.4(2)
6. D 721.2.2.3.1
7. A 721.2.4.4
8. B 721.3.1.4
9. C 721.3.2.5 (1)
10. A FIGURE 721.5.1 (2) NOTE (3) PAR 2
11. B TABLE 715.4
12. C 708.13.3
13. A 708.13.1

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Chapter 9

Worksheet

1. Automatic fire sprinklers are not required for:
 - a. Basement areas with less than 1,500 sq. ft.
 - b. buildings with suitable access on at least one side of each story above grade.
 - c. nightclubs and lounges less than 500 sq. ft. when located in a basement.
 - d. Both a & b

2. Automatic sprinklers are required anytime a Group M occupancy with combustible materials on display for public sale and the fire area exceeds ____ sf.
 - a. 12,000
 - b. 14,000
 - c. 18,000
 - d. 20,000

3. Automatic sprinkler systems must be monitored by a supervising station, unless they are limited area systems serving fewer than ____ sprinklers.
 - a. 20
 - b. 19
 - c. Both a & b
 - d. Neither a or b

4. All smoke detectors in Group R-1 occupancies are required to be installed in the following areas:
 - a. at least one per story within the sleeping unit
 - b. one in every sleeping room or area
 - c. one outside of every sleeping room in the means of egress
 - d. all of the above

5. In buildings where a fire alarm system is required, visible alarm notification appliances are not required in the following _____.
 - a. public areas, like a lobby
 - b. common areas like a break room
 - c. in exits as defined in 1002.1
 - d. in building alterations where no fire alarm system work occurs

6. An automatic sprinkler system shall be installed in rubbish and linen chutes in the following locations _____.
 - a. terminal rooms
 - b. top of the chute
 - c. chutes three or more stories tall shall have additional accessible sprinkler heads
 - d. all of the above

7. In new and existing buildings protected with quick response sprinklers, it is acceptable to eliminate portable fire extinguishers in _____.
 - a. Group A
 - b. Group S
 - c. Group B
 - d. Group I

8. Stages over 1,000 sf in area shall be equipped with a _____ wet standpipe system with 1 ½ inch and 2 ½ inch connections on _____ side(s) of the stage.
 - a. Class I, one
 - b. Class II, two
 - c. Class III, one
 - d. Class III, each

9. Manual pull stations for commercial cooking systems shall be near the _____, positioned _____ feet from the exhaust system.
 - a. deep fat fryer, 5
 - b. means of egress, between 10-20
 - c. 10 burner range, 14
 - d. kitchen, 40

10. Wiring and controls for operation and control of smoke exhaust fans shall be _____.
 - a. protected against temperatures over 1,000 degrees F
 - b. accessible to the fire service from the exterior
 - c. connected ahead of the main disconnect
 - d. all of the above

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Chapter 9

Answer Key

1. D 903.2.11.1
2. A 903.2.7
3. A 903.4 EXCEPTION #2
4. D 907.2.11.1
5. C 907.5.2.3 EXCEPTION #2
6. D 903.2.11.2
7. C 906.1 #1 EXCEPTION
8. D 905.3.4
9. B 904.11.1
10. D 910.4.4

Level III

Chapter 10

Worksheet

1. Stairs serving as a means of egress must have a minimum head room clearance of _____.
 - a. 7', 2"
 - b. 7', 0"
 - c. 6', 8"
 - d. 7', 6"

2. How far apart must the exits be in an unsprinklered Business Occupancy with dimensions of 30' X 40' with two required exits?
 - a. 45.85 feet
 - b. 33.50 feet
 - c. 22.91 feet
 - d. 50 feet

3. In general, ramps with a rise greater than 6" shall have a hand rail on _____ side(s) and be at least _____ inches high.
 - a. 1, 38
 - b. 2, 34
 - c. 2, 38
 - d. 1, 34

4. What is the maximum dead-end length in a NFPA 13 sprinklered Group B occupancy corridor?
 - a. 50 feet
 - b. 20 feet
 - c. 35 feet
 - d. none of the above

5. A one story, sprinklered restaurant has a 40' X 40' dining room. It is lined around the exterior wall by 24 booths, each having 2 seats 48" long. Each booth occupies 24 sf of floor area. What is the maximum seating capacity, if the rest of the dining room has movable tables and chairs?
- a. 106 persons
 - b. 68 persons
 - c. 164 persons
 - d. 99 persons
6. How many exits are required in the restaurant in the previous question?
- a. 1
 - b. 2
 - c. 3
 - d. 4
7. What is the minimum clear opening width of the exit(s) doors required in the restaurant in question 5?
- a. 32 inches
 - b. 36 inches
 - c. 44 inches
 - d. 24.60 inches
8. Without applying exceptions, guard rails on open sided stairs shall have intermediate rails or ornamental patterns spaced so that a _____ diameter sphere cannot pass through any openings within 34 inches of the floor.
- a. 4 inches
 - b. 6 inches
 - c. 8 inches
 - d. there is no maximum
9. Exit signs are required in all of the following spaces except _____.
- a. access to exits
 - b. corridors leading to an exit
 - c. where the exit is not clear
 - d. spaces requiring only one means of egress

10. Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet wide that contain control devices shall be equipped with _____.
- a. an exit door
 - b. bolt lock
 - c. panic hardware
 - d. panic hardware or fire exit hardware
11. Parking structures shall not have less than _____ exits from each parking tier.
- a. one
 - b. two
 - c. three
 - d. depends on the size of the parking structure
12. Exit enclosures shall terminate at a(n) _____.
- a. exit discharge
 - b. exit passageway
 - c. public way
 - d. Both a or c
13. Emergency escape and rescue openings are _____ in basements without habitable spaces that are no larger 200 sf.
- a. not required
 - b. always required
 - c. never installed
 - d. usually installed
14. Exits in Group A occupancies with more than 300 occupants are required to discharge _____ percent out of the main exit.
- a. 25
 - b. 40
 - c. 50
 - d. 100
15. The common path of egress travel shall not exceed _____ feet in a Group H-2 facility.
- a. 15
 - b. 25
 - c. 50
 - d. 75

Level III

Chapter 10

Answer Key

1. C 1009.2
2. C 1015.2.1
3. B 1010.8
4. A 1018.4 EXCEPTION #2
5. B TABLE 1004.1.1
6. B TABLES 1021.1
7. A 1008.1.1
8. A 1013.3
9. D 1011.1 EXCEPTION #1
10. D 1008.1.10
11. B 1021.1.2
12. D 1022.2
13. A 1029.1 EXCEPTION #7
14. C 1028.2
15. B 1014.3

LEVEL III

CHAPTER 16

WORKSHEET

1. What figure shows the basic wind speed for the determination of wind loads?
 - A. Figure 1608
 - B. Figure 1609
 - C. Figure 1609.6.2.1(1)
 - D. Figure 1610.1
2. What is the uniformly distributed live load for a corridor on the first floor of an office structure?
 - A. 80 psf
 - B. 90 psf
 - C. 100 psf
 - D. 40 psf
3. Grab bars shall be designed to resist a single concentrated load of ____ applied in any direction at any point?
 - A. 200 psi
 - B. 150 psi
 - C. 250 psf
 - D. 250 pounds
4. Vehicle barrier systems for passenger cars shall resist a minimum of which of the following.
 - A. 60,000 lbs at 1 ft 8 in. above the floor
 - B. 6,000 lbs at 1 ft. 8 in. above the floor
 - C. 2,500 lbs at 2 ft. 4 in. above the ramp
 - D. 6,000 lbs psf at 1 ft. 6 in. above the floor

LEVEL III

CHAPTER 16

ANSWER KEY

1. B. 1609.3, FIG 1609
2. C. TABLE 1607.1
3. D. 1607.7.2
4. D 1607.7.3

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Chapter 17

Worksheets

1. Special inspections area required for which of the following?
 - a. smoke control systems
 - b. steel
 - c. concrete
 - d. all of the above

2. What is the correct reference standard for welding of structural steel?
 - a. AWS D1.1
 - b. AWS D1.4
 - c. ACI 318
 - d. AISC A.3.6

3. Special inspection agencies that test smoke control systems must have expertise in _____.
 - a. fire protection engineering
 - b. mechanical engineering
 - c. certification as air balancers
 - d. all of the above

4. In conducting a preconstruction load test, the tested assembly shall be considered to have successfully met the test requirements if the assembly recovers not less than _____ of the maximum deflection within _____ after the removal of the test loads.
 - a. 50, 12
 - b. 90, 24
 - c. 75, 24
 - d. 75, 12

5. What is the correct standard for joist hangers?
- ASTM D 1143
 - ASTM D 1761
 - ASTM E 72
 - ASTM E 196
6. Aluminum, vinyl and wood exterior windows and glass doors shall be labeled as conforming to _____.
- AANA/NWWAD/101/1.S.2
 - AAMA/DWWA/101/1.S.2
 - exterior door and window requirements
 - AAMA/WDMA/CSA101/I.S.2/A440
7. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent data as required by the registered design professional for _____ foundations.
- cast-in-place deep
 - driven deep
 - helical pile
 - vertical masonry
8. In level 1 masonry construction, how often shall the construction of mortar joints be verified and inspected, prior to grouting?
- once per hour
 - once per day
 - once per wall
 - periodic
9. Sprayed fire-resistant materials shall be a minimum allowable thickness of _____ or greater.
- 1 inch
 - what the approved fire-resistance design requires
 - ¼ inch
 - 12 inches by 12 inches

10. What is the minimum height that requires special inspection for storage racks anchoring in structures assigned to Seismic Design Category D, E or F?
- a. any metal racks
 - b. in a high-piled storage facility as required in section 413.1
 - c. 6 feet
 - d. 8 feet

Level III

Chapter 17

Answer Key

1. D 1704.3, 1704.4, 1704.16
2. A 1704.3.1.1
3. D 1704.16.2
4. C 1715.3.1
5. B 1716.1.1
6. D 1714.5.1
7. C 1704.10
8. D TABLE 1704.5.1 #6 D
9. B 1704.12.4
10. D 1707.5

Level III

Chapter 18

Worksheet

1. A column carrying a load of 30 kips is to be erected on silty sand. If presumptive bearing capacities are used as design criteria, which column footing size is most appropriate?
 - a. 24" x 24"
 - b. 30" x 30"
 - c. 48" x 48"
 - d. None of the above

2. A design shows a 10 inch open ended steel pipe pile with a $\frac{1}{4}$ wall thickness. Is this permitted by the code?
 - a. Yes
 - b. No

3. Concrete in foundations shall have a specified compressive strength of not less than ____ pounds per square inch.
 - a. 3,000
 - b. 3,500
 - c. 2,000
 - d. 2,500

4. Pier and curtain wall foundations shall be permitted to be used to support Type V construction in dwellings not more than _____ stories in height.
 - a. 3
 - b. 2
 - c. 1
 - d. Not allowed

5. The minimum width of a turn down slab shall be _____ inches unless designed by an engineer.
 - a. 12
 - b. 16
 - c. 8
 - d. 20

6. Plain concrete footings for Group R-3 occupancies are permitted to be a minimum of _____ inches in thickness.
- a. 4
 - b. 6
 - c. 8
 - d. 10
7. What is the maximum height of a 4-inch load bearing masonry wall supporting wood frame walls and floors?
- a. 3 feet
 - b. 4 feet
 - c. 6 feet
 - d. 10 feet
8. Foundation drains can not contain more than 10% of material that pass through a _____.
- a. #4 sieve
 - b. #6 sieve
 - c. #8 sieve
 - d. #10 sieve
9. A pile load test shall be performed if _____ shaft stress is exceeded.
- a. 200 psi
 - b. 300 psi
 - c. 400 psi
 - d. 1,200 psi

10. Steel cased piles shall not be less than _____ in diameter.
- a. 8 inches
 - b. 10 inches
 - c. 12 inches
 - d. 16 inches
11. Cast in place concrete pile shall be deigned by a registered design professional if the length of the pile exceeds _____ times the diameter.
- a. 5
 - b. 10
 - c. 25
 - d. 30
12. In driven precast concrete pile foundations, piles having a diameter of 16 inches or less shall have ties not smaller than _____.
- a. No. 3 gage
 - b. No. 5 gage
 - c. No. 6 gage
 - d. No. 7 gage
13. Retaining walls providing a vertical relief of five feet within a horizontal distance of _____ feet shall be designed by a registered design professional.
- a. 30
 - b. 50
 - c. 75
 - d. 100
14. Where a basement is considered a story above grade and the finished ground level adjacent to the basement wall is below the _____ basement floor elevation for _____ % or more of the perimeter, the basement walls and floors shall be damp proofed.
- a. 25
 - b. 50
 - c. 30
 - d. 75

15. What number and type of rebar is required for an 7.5 inch concrete foundation wall with a designlateral soil load of 60 psf/ ft, with a wall height of 8 feet and 6 feet of unbalanced fill?
- a. #4 – 43 inches on center
 - b. #5 – 43 inches on center
 - c. #6 – 43 inches on center
 - d. #8 – 43 inches on center
16. Plain concrete foundation walls with five feet of unbalanced fill against a seven foot wall sited in "SC" type soil shall be a minimum thickness of _____.;
- a. 8 inches
 - b. 7.5 inches
 - c. 10 inches
 - d. 12 inches
17. What is the minimum size of a column footing sited in sedimentary rock supporting a load of 80,000 pounds?
- a. 4.47 feet x 4.47 feet
 - b. 2.66 feet x 2.66 feet
 - c. 2 feet x 2 feet
 - d. 2.33 feet x 2.33 feet
18. What is the allowable bearing capacity of loose sand?
- a. 2,000 psf
 - b. 3,000 psf
 - c. 4,000 psf
 - d. 5,000 psf

Level III

Chapter 18

Answer Key

1. C TABLE 1806.2
2. A 1810.3.5.3.2
3. D TABLE 1808.8.1
4. B 1809.10
5. A 1809.4
6. B 1809.8, EXCEPTION
7. B 1809.10.4
8. A 1805.4.2
9. C 1810.3.5.2.4
10. A 1810..3.5.3.2
11. D 1810.3.5.2.2 EXCEPTION
12. B 1810.3.8.1
13. B 1807.2.5
14. A 1805.1.1
15. B TABLE 1807.1.6.2
16. C 1807.1.6.2, ALSO 1610.1
17. A TABLE 1806.2
18. A TABLE 1806.2

Level III

Chapter 19

Worksheet

1. In reinforced concrete, the nominal maximum size of coarse aggregate shall not be larger than _____.
 - a. $\frac{1}{2}$ the least dimension between the sides of the forms
 - b. $\frac{1}{4}$ the depth of slabs
 - c. $\frac{3}{5}$ the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or pre-stressing tendons or ducts.
 - d. per ACI 318 specifications

2. Per ACI, air entrainment is required when the concrete is located in _____.
 - a. Severe exposure
 - b. Moderate exposure
 - c. Both A & B
 - d. None of the above

3. The placement of metal reinforcement in concrete _____.
 - a. shall not be welded
 - b. shall comply with ACI 318, Section 7.5
 - c. shall not have rust or mill scale
 - d. both A and C

4. The specified compressive strength for concrete shall not be less than _____ psi.
 - a. 2,500
 - b. 3,000
 - c. 3,500
 - d. 7,500

5. In North Carolina, the minimum specified strength of concrete in basement walls exposed to moderate weathering shall be _____.
- a. 2,500 psi
 - b. 3,000 psi
 - c. 3,000 psi, air entrained
 - d. 3,500 psi, air entrained
6. Sample for strength tests of each class of concrete placed each day shall be taken not less than _____.
- a. once a day
 - b. once for each 150 cubic yards of concrete
 - c. once for each 5,000 square feet of surface area
 - d. in accordance with ACI 318
7. How many concrete cylinders are required to conduct a 28-day strength test?
- a. 1
 - b. in accordance with ACI 318
 - c. 3
 - d. 45
8. The minimum cover for #6 rebar in cast in place concrete exposed to the earth or weather is _____ inches.
- a. in accordance with ACI 318
 - b. 1.5
 - c. 0.75
 - d. 54
9. A vapor barrier is required to be installed under all slab on grade.
- a. Yes
 - b. No

10. What is the allowable service load of $\frac{3}{4}$ bolts with 5 inches of embedment in 3,000 psi concrete, 4.5 inches from the edge in shear?
- a. 3,250 pounds
 - b. 3,560 pounds
 - c. 4,275 pounds
 - d. 4,300 pounds
11. When the total volume of a given class of concrete is less than _____ cubic yards, strength tests are not required.
- a. 25
 - b. 50
 - c. 75
 - d. 100
12. Structural plain concrete bearing walls shall not be less than _____ inches in thickness.
- a. 3.5
 - b. 4
 - c. 5.5
 - d. 6
13. Special inspections shall be conducted of concrete elements of buildings and structures as required by Chapter _____.
- a. 1
 - b. 5
 - c. 10
 - d. 17
14. Where openings in walls occur with structural plain concrete, at least _____ rebar shall be No. _____ around windows and doors.
- a. one, 4
 - b. one, 5
 - c. one, 6
 - d. two, 5

15. Shotcrete shall be kept moist for at least _____ hours and shall be maintained above _____ degrees F.
- a. 12, 24
 - b. 12, 32
 - c. 24, 40
 - d. 24, 68

Level III

Chapter 19

Answer Key

1. D 1903.1, ACI 318
2. C TABLE 1904.3 NOTE B
3. B 1907.5
4. A TABLE 1904.3
5. C TABLE 1904.3
6. D 1905.6.2
7. B 1905.6.3
8. A 1907.5
9. B 1910.1 EXCEPTIONS
10. B TABLE 1911.2
11. B 1905.6.2 EXCEPTION
12. C 1909.6.2
13. D 1901.5
14. B 1909.6.3
15. C 1913.9.1, 1913.9

Level III

Chapter 21

Worksheets

1. The maximum spacing for weep holes in masonry walls is _____.
 - a. 24 inches on center
 - b. 36 inches on center
 - c. 33 inches on center
 - d. 60 inches on center

2. The minimum compressive strength for type M mortar is _____ psi.
 - a. 2,500
 - b. 1,800
 - c. 750
 - d. 350

3. The minimum thickness of masonry bearing walls more than one story high shall be ____ inches.
 - a. 6
 - b. 10
 - c. 8
 - d. 12

4. The design for lintels shall provide for a minimum support at the _____ ends of _____ inches in length.
 - a. 2
 - b. 3
 - c. 4
 - d. 5

Level III

Chapter 21

Answer Key

1. C 2104.1.8
2. A TABLE 2103.8 (2)
3. C 2109.5.2
4. C 2104.1.5

Level III

Chapter 22

Worksheet

1. What organization writes the specification for the design fabrication and erection of structural steel?
2. What organization writes the specification for welding in building construction?
3. What are the two types of high strength bolts?
4. What does ASTM stand for?
5. What is the nominal depth of a W14 X 38 beam?
6. What is the nominal weight per linear foot of a W-14 x 38 beam?

Level III

Chapter 22

Answer Key

1. AISC
2. AWS
3. A325, A490
4. American Society for Testing Materials
5. 14"
6. 38 lb/ft

Level III

Chapter 30

Worksheet

1. A five story building with 9 elevators, each serving all floors, will require a minimum of how many hoist ways?
 - a. 1
 - b. 2
 - c. 3
 - d. 4

2. Hoist way walls in a 6-story building must be fire rated to _____.
 - a. 1 hour
 - b. 2 hours
 - c. 3 hours
 - d. 4 hours

3. A new building is planned with 4 elevators, 2 each in 2 hoist ways. Each hoist way is 12' X 8'. What area of vents is required for each hoist way?
 - a. 4.360 sq. ft.
 - b. 6 sq. ft.
 - c. 8.72 sq. ft.
 - d. not enough information

4. Where only one elevator is installed in a building where standby power is required or furnished the elevator shall automatically transfer to standby power within _____ seconds after permanent power failure.
 - a. 10
 - b. 30
 - c. 60
 - d. 120

5. Sumps and sump pumps shall be permitted at the base of the shaft provided they are _____ connected to the plumbing system.
- a. indirectly
 - b. directly vented
 - c. of PVC pipes
 - d. cast iron pipes
6. Holes in the machine room floors for the passage of ropes, cables or other moving elevator equipment shall be limited so as not to provide greater than _____ inches of clearance on all _____ sides.
- a. 4
 - b. 3
 - c. 2
 - d. 1

Level III

Chapter 30

Answer Key

1. C 3002.2
2. B 3002.1
3. B 3004.3
4. C 3003.1.2
5. A 3004.5 EXCEPTION
6. C 3004.2