ANSWER SHEET • 2023 Oregon Plumbing Specialty Code Change • Course No. 5000173V

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Option 2:

1. Mail your answer sheets* and a check payable to **American Plumbing Institute** to:

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1. A B C D	21. A B C D	41. A B C D	61. A B C D
2. A B C D	22. A B C D	42. A B C D	62. A B C D
3. A B C D	23. A B C D	43. A B C D	63. A B C D
4. A B C D	24. A B C D	44. A B C D	64. A B C D
5. A B C D	25. A B C D	45. A B C D	65. A B C D
6. A B C D	26. A B C D	46. A B C D	66. A B C D
7. A B C D	27. A B C D	47. A B C D	67. A B C D
8. A B C D	28. A B C D	48. A B C D	68. A B C D
9. A B C D	29. A B C D	49. A B C D	69. A B C D
10. A B C D	30. A B C D	50. A B C D	70. A B C D
11. A B C D	31. A B C D	51. A B C D	71. A B C D
12. A B C D	32. A B C D	52. A B C D	72. A B C D
13. A B C D	33. A B C D	53. A B C D	73. A B C D
14. A B C D	34. A B C D	54. A B C D	74. A B C D
15. A B C D	35. A B C D	55. A B C D	75. A B C D
16. A B C D	36. A B C D	56. A B C D	76. A B C D
17. A B C D	37. A B C D	57. A B C D	77. A B C D
18. A B C D	38. A B C D	58. A B C D	78. A B C D
19. A B C D	39. A B C D	59. A B C D	79. A B C D
20. A B C D	40. A B C D	60. A B C D	80. A B C D

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2023 Oregon Plumbing Specialty Code Change

104.3 Application for Permit. To obtain a permit, the applicant shall first file an application therefore in writing or digitally, on a form furnished by the Building Official for that purpose, such application shall:

(1) Identify and describe the work to be covered by the permit for which application is made.

(2) Describe the land upon which the proposed work is to be done by legal description, street address, or similar description that will readily identify and definitely locate the proposed building or work.

(3) Indicate the use or occupancy for which the proposed work is intended.

(4) Be accompanied by construction documents in accordance with Section 104.3.1.

(5) Be signed by the permittee or the permittees authorized agent. The Building Official shall be permitted to require evidence to indicate such authority.

(6) Give such other data and information in accordance with the Building Official.

104.3.1 Construction Documents. Where required under 918-780-0040, construction documents, engineering calculations, diagrams, and other data shall be submitted in two or more sets, or in a digital format where permitted by the Building Official, with each application for a permit. The construction documents, computations, and specifications shall be prepared by, and the plumbing designed by, a registered design professional. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when approved by the Building Official. Construction documents shall identify with clarity that the intended work to be performed is in accordance with the code.

Manufacturers installation instructions, as required by this code, shall be available on the job site at the time of inspection.

Exception: The Building Official shall be permitted to waive the submission of construction documents, calculations, or other data where the Building Official finds that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with the code.

104.4.5 Suspension or Revocation. The Building Official shall be permitted to, in writing, suspend or revoke a permit issued under the provisions of this code where the permit is issued in error or on the basis of incorrect information supplied or in violation of other state laws.

Authority Having Jurisdiction. The organization, office, or individual responsible for enforcing other requirements that are not part of this code. The authority having jurisdiction shall be a federal, state, or municipal authority. In the absence of statutory authority, the Authority Having Jurisdiction may be some other responsible party. This definition shall include the Authority Having Jurisdiction's duly authorized representative.

Building Code. Shall mean the Oregon Structural Specialty Code as adopted by OAR 918-460-0100.

Building Drain. That part of the lowest piping of a drainage system that receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer beginning 5 feet outside the building wall.

Building Official. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative of the Building Official.

Building Sewer. See OAR-918-690-0410 and ORS 701.348.

Diverter Valve, Gray Water. A valve that directs gray water to the sanitary drainage system or a subsurface irrigation system.

Exam Questions:

1. **How many different items are listed to be specifically completed for a plumbing permit?**
   A. 3
   B. 8
   C. 5
   D. 6

2. **According to regulation 918-780-0040, what must be submitted with each application for a permit?**
   A. A detailed construction timeline and budget estimate in triplicate copies
   B. Construction documents, engineering calculations, diagrams, and other data in two or more sets, or in a digital format if allowed by the Building Official
   C. A compliance certificate from a licensed architect or engineer
   D. Environmental impact assessment reports and neighborhood consent forms

3. **According to the code, what must be available on the job site at the time of inspection?**
   A. An emergency contact list for all involved staff
   B. A project manager with a detailed briefing
   C. A list of all tools and equipment being used
   D. Manufacturers installation instructions

4. **According to the code, who or what can assume the role of the authority having jurisdiction?**
   A. Any construction company involved in the project
   B. A local community group
   C. A federal, state, or municipal authority
   D. The property owner where the project is located

5. **What is the name of the part of the drainage system described as the lowest piping that receives discharge from soil, waste, and other drainage pipes inside a building and conveys it to the building sewer starting 5 feet outside the building wall?**
   A. The septic tank
   B. The building drain
   C. The inspection chamber
   D. The downspout

6. **What is the function of a Diverter Valve, Gray Water, according to the code?**
   A. It directs gray water to the sanitary drainage system or a subsurface irrigation system
   B. It monitors water pressure within the plumbing system
   C. It filters impurities from the water before entering the main supply
   D. It regulates the temperature of water in heating systems

Diverter Valve, On Site Treated Nonpotable Water. A component in the collection system to control inflow and overflow in collection tanks intended for on-site treatment and direct beneficial use.

Diverter Valve, Rainwater. A component in commercial rainwater catchment systems to control high inflow and overflow volumes in rainwater storage tanks.

Dwelling. Any building that contains one or two dwelling units used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.

Dwelling Unit. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

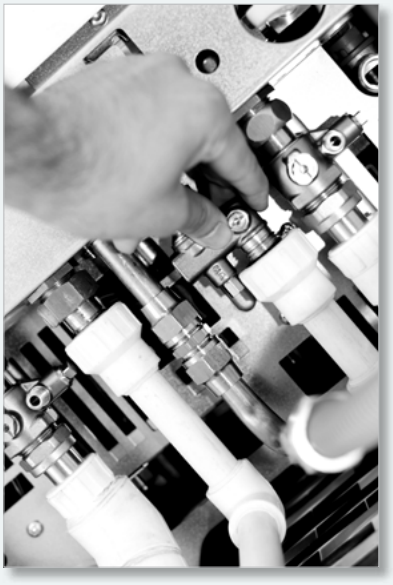
Electrical Code. Shall mean the Oregon Electrical Specialty Code as adopted by OAR 918-305-0100.

Flood Hazard Area. The area designated as a flood hazard by the Flood Plain Administrator.

Flood Hazard Area Subject to High Velocity Wave Action. Area within the flood hazard area that is subject to high velocity wave action, and shown on a Flood Insurance Rate Map or other flood hazard map as Zone V, VO, VE or V1-30.

Flood Plain Administrator. See Section 102.3.1.

Food Service Establishment. A facility that engages in activities of preparing or serving food or beverage for consumption by person(s) either on or off the premises, including but not limited to restaurants, cafes, commercial kitchens, caterers, hotels and motels, schools, hospitals, prisons, correctional facilities, nursing homes, care institutions, and any other facility preparing and serving food for consumption.



Lot. A single or individual parcel or area of land legally recorded or validated by other means acceptable to the municipality on which is situated a building or which is the site of any work regulated by this code, together with the yards, courts, and unoccupied spaces legally required for the building or works, and that is owned by or is in the lawful possession of the owner of the building or works.

Manufacture Dwelling Code. Shall mean the Oregon Manufactured Dwelling Installation Specialty code as adopted by OAR 918-500-0510.

Plumbing. Defined in ORS 447.010(6).

Potable Water. Water that is satisfactory for drinking, culinary, and domestic purposes and that meets the requirements of the Health Building Official.

Private Sewage Disposal System. A septic tank with the effluent discharging into a subsurface disposal field, into one or more seepage pits, or into a combination of subsurface disposal field and seepage pit or of such other facilities as may be permitted under the procedures set forth by other regulating agencies.

Groundwater. Water that exists beneath the earth's surface.

Health Care Facilities. Buildings or portions of buildings in which human medical, dental, psychiatric, nursing, obstetrical, or surgical care is provided.

Exam Questions:

7. **What is the primary function of a Diverter Valve for On-Site Treated Nonpotable Water as described in the code?**
   - A. It purifies water for safe consumption
   - B. It controls inflow and overflow in collection tanks intended for on-site treatment and direct beneficial use
   - C. It redirects potable water to different sections of a plumbing system
   - D. It ensures the water is maintained at a constant temperature

8. **What is the primary function of a Diverter Valve in commercial rainwater catchment systems?**
   - A. It controls high inflow and overflow volumes in rainwater storage tanks
   - B. It purifies rainwater for drinking purposes
   - C. It redirects rainwater to different landscapes for irrigation
   - D. It maintains the temperature of the rainwater in the storage tanks

9. What does a dwelling unit provide?

A. A temporary shelter equipped only with essential sanitation amenities
B. Basic accommodations for short-term visitors without permanent provisions
C. A shared living space designed for communal activities
D. Complete independent living facilities with provisions for living, sleeping, eating, cooking, and sanitation

10. What type of facility is described as preparing or serving food or beverages for consumption by individuals either on or off the premises?

A. Retail grocery store
B. Food service establishment
C. Food manufacturing plant
D. Beverage bottling facility

11. Which term refers to the code that governs the installation of manufactured dwellings in Oregon as adopted by OAR 918-500-0510?

A. Architectural design code
B. Building construction code
C. Residential zoning code
D. Manufacture dwelling code

12. What term is used to describe water that exists beneath the earth's surface?

A. Groundwater
B. Surface water
C. Rainwater
D. Runoff water

13. Which term describes buildings or structures where human medical, dental, psychiatric, nursing, obstetrical, or surgical care is provided?

A. Government offices
B. Educational institutions
C. Health care facilities
D. Retail centers

Mid-Story Guide. A support designed to keep piping in alignment, located half-way between floors or a floor and ceiling.

Plumbing System. Includes all potable water, alternate water sources, building supply, and distribution pipes; all plumbing fixtures and traps; all drainage and vent pipes; and all building drains and building sewers, including their respective joints and connections, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable water treating or using equipment, medical gas and medical vacuum systems, liquid and fuel gas piping, and water heaters.

Vented Line. A horizontal soil or waste pipe with a vented fixture upstream, on the same floor level.

301.2 Minimum Standards. Pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed (third party certified) by a listing agency (accredited conformity assessment body) as complying with the approved applicable recognized standards referenced in this code, and shall be free from defects. Unless otherwise provided for in this code, materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof shall be submitted to the Building Official for approval prior to being installed.

301.2.1 Marking. Each length of pipe and each pipe fitting, trap, fixture, material, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it any markings required by the applicable reference standards and listing agency, and the manufacturers mark or name, which shall readily identify the manufacturer to the end user of the product. Where required by the approved standard that applies, the product shall be marked with the weight and the quality of the product. Materials and devices used or entering into the construction of plumbing and drainage systems, or parts thereof

shall be marked and identified in a manner satisfactory to the Building Official. Such marking shall be done by the manufacture. Field markings shall not be acceptable.

301.3 Alternate Materials and Methods of Construction Equivalency. Alternate materials and methods shall be requested in accordance with Chapter 1 of this code.

301.3.1 Testing. The Building Official shall have the authority to require tests, as proof of equivalency.

301.3.1.1 Tests. Tests shall be made in accordance with approved or applicable standards, by an approved testing agency at the expense of the applicant. In the absence of such standards, the Building Official shall have the authority to specify the test procedure.

301.3.1.2 Request by Building Official. The Building Official shall have the authority to require tests to be made or repeated where there is reason to believe that a material or device no longer is in accordance with the requirements on which its approval was based.

301.4 Flood Hazard Areas. Plumbing systems shall be located above the design flood elevation as determined by the Flood Plain Administrator.

Exception: Plumbing systems shall be permitted to be located below the design flood elevation provided that the systems are designed and installed to prevent water from entering or accumulating within their components, and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.

301.4.1 Coastal High Hazard Areas. Plumbing systems in buildings located in coastal high hazard areas as determined by the Flood Plain Administrator, shall not have plumbing systems, pipes, and fixtures mounted on or penetrate through walls that are intended to break away under flood loads in accordance with the building code.

301.5.3 Design Documents. The registered design professional shall provide two complete sets of signed and sealed design documents for the alternative engineered design for submittal to the Building Official. The design document shall include floor plans and a riser diagram of the work. Where appropriate, the design document shall indicate the direction of flow, pipe sizes, grade of horizontal piping, loading, and location of fixtures and appliances.

301.5.4 Design Approval. An approval of an alternative engineered design shall be at the discretion of the Building Official. The exercise of this discretionary approval by the Building Official shall have no effect beyond the jurisdictional boundaries of said Building Official. An alternative engineered design so approved shall not be considered as in accordance with the requirements, intent, or both of this code for a purpose other than that granted by the Building Official.

Exam Questions:

14. What is the term for a support that is designed to keep piping in alignment and is located mid-way between floors or a floor and ceiling?

A. Mid-Story Guide
B. Anchorage Support
C. Vertical Brace
D. Expansion Joint

15. Which of the following best describes a "plumbing system"?

A. Includes all potable water, alternate water sources, building supply and distribution pipes; all plumbing fixtures and traps; all drainage and vent pipes; and all building drains and building sewers, including their respective joints and connections, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable water treating or using equipment, medical gas and medical vacuum systems, liquid and fuel gas piping, and water heaters
B. Includes only the drainage and waste management components within a building
C. Refers solely to the fixtures and appliances connected to the water supply in a building
D. Specifies only the potable water supply and the management of waste water in residential settings

16. Which of the following best describes a "vented line"?

A. A vertical pipe that carries waste to the sewer and has a rooftop vent
B. A horizontal soil or waste pipe with a vented fixture upstream, on the same floor level
C. A pipe that solely carries vent gases out of the building
D. A horizontal pipe with vents at both ends regardless of fixture location

17. According to the information provided, how should one request the use of alternate materials and methods in construction?

A. They should be approved by a local contractor
B. They must be requested in accordance with Chapter 1 of the code
C. They must be presented in a public hearing
D. They should be requested in writing to the building owner

18. Under what circumstances does the Building Official have the authority to require tests to be made or repeated?

A. When a material or device is newly introduced in the market
B. When an applicant submits a request for additional testing
C. When a material or device may no longer be in accordance with the requirements on which its approval was based
D. When there is a policy change at the local government's building department

19. In coastal high hazard areas, what is a key requirement for plumbing systems in buildings according to the Flood Plain Administrator?

A. Plumbing systems, pipes, and fixtures should be reinforced to withstand flood loads
B. Plumbing systems must be installed below the ground level
C. Plumbing systems, pipes, and fixtures should not be mounted on or penetrate through walls intended to break away under flood loads
D. Plumbing systems can be mounted on any wall, regardless of flood load considerations

301.5.5 Design Review. The Building Official shall have the authority to require testing of the alternative engineered design in accordance with Section 301.3.1, including the authority to require an independent review of alternate materials or engineered systems by a registered design professional and at the expense of the applicant.

306.1 Detrimental Wastes. Waste detrimental to the public sewer system or detrimental to the functioning of the sewage treatment plant shall be treated and disposed of as found necessary and directed by the Building Official.

306.2 Safe Discharge. Sewage or other waste from a plumbing system that is capable of being deleterious or surface or subsurface waters shall not be discharged into the ground or waterway unless it has first been rendered safe by some acceptable form of treatment in accordance with the requirements of this code.

309.5 Dead Legs. Dead legs shall have an accessible method of flushing and shall not exceed 1.5 times the diameter of the pipe.

310.9 Female Plastic Connections. Female plastic threaded connections shall not be allowed to be used when threaded onto a male metallic connection.

310.10 ABS and PVC Transition Joints. Except as provided in Section 705.9.4, PVC and ABS pipe and fittings shall not be solvent welded to any other unlike material.

311.1 General. The drainage system of each new building and new work installed in an existing building shall be separate and independent from that of any other building, and, where available, every building shall have an independent connection with a public or private sewer.

Exception: Where one building stands in the rear of another building on an interior lot, and no public or private sewer is available or can be constructed to the rear building through an adjoining court, yard, or driveway, the building drain from the front building shall be permitted to be extended to the rear building.

312.3 Building Sewer and Drainage Piping. No building sewer or piping or part thereof, constructed of materials other than those approved for use under or within a building, shall be installed under or within 5 feet of a building or structure, or less than 1 foot below the surface of the ground.

312.6 Freezing Protection. No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

313.1 General. Piping, fixtures, appliances, and appurtenances shall be supported in accordance with this code and the manufacturer's installation instructions. Except as provided in Section 507.2, seismic restraints shall be in accordance with the building code.

313.2 Material. Hangers, supports, and anchors shall be of sufficient strength to support the weight of the pipe and its contents. Piping shall be isolated from incompatible materials.

315.1 Unions. Approved unions shall be permitted to be used in drainage piping where accessibly located in the trap seal or between a fixture and its trap; in the vent system, except underground or in wet vents; at any point in the water supply system.

319.1 Medical Gas and Vacuum Systems. General. Such piping shall be in accordance with the requirements of Chapter 13.

408.2 Water Consumption. Showerheads shall have a maximum flow rate of not more than 1.8 gpm at 80 psi (6.8 L/m at 552 kPa).

Exam Questions:

20. What is required for dead legs in a plumbing system according to Section 309.5?

A. They should be capped and not used more than once every 6 months
B. They should be insulated to prevent heat loss and not exceed 3 times the diameter of the pipe
C. They can be any length, provided they are clearly marked and maintained
D. They must have an accessible method of flushing and not exceed 1.5 times the diameter of the pipe

21. According to Section 310.9, what is prohibited regarding female plastic threaded connections?

A. They are allowed only if reinforced with metal linings
B. They must be used with a specific anti-corrosion treatment
C. They are required to have a double seal for extra safety
D. They shall not be used when threaded onto a male metallic connection

22. According to Section 310.10, what is prohibited regarding ABS and PVC transition joints?

A. Solvent welding PVC and ABS pipe and fittings to any other unlike material
B. Using mechanical joints for connecting PVC and ABS pipes
C. Mixing ABS and PVC materials in underground installations
D. Joining PVC and ABS with thermal fusion methods

23. In what scenario is it permitted to extend the building drain from a front building to a rear building on an interior lot?

A. When the pipes are made of the same material for both buildings
B. When the distance between the front and rear buildings is less than 50 feet
C. When the rear building is used for commercial purposes
D. When no public or private sewer is available, or can be constructed, to the rear building through an adjoining court, yard, or driveway

24. Under what conditions is it not permitted to install water, soil, or waste pipes?

A. When the pipes are installed inside a fully insulated interior wall of a building
B. When the pipes are installed outside of a building or in an exterior wall without adequate protection from freezing
C. When the pipes are embedded in a concrete foundation inside the building
D. When the pipes are installed indoors within a heated mechanical room

25. Which of the following statements aligns with the requirements for the support and restraint of piping, fixtures, appliances, and appurtenances?

A. They must be supported based exclusively on local practices, with no reference to the code or manufacturer's guidance
B. They should be supported only according to the manufacturer's installation instructions, with no mention of seismic restraints
C. They must be supported per the code and the manufacturer's instructions, with seismic restraints as per the building code, except as provided in Section 507.2
D. Seismic restraints are required by default in all installations, regardless of any exceptions provided by other sections

26. Based on the requirements for hangers, supports, and anchors described in Section 313.2, which statement is correct?

A. The code specifies that only metal hangers, supports, and anchors should be used for all types of piping
B. Piping can be supported by any materials as long as they are readily available, regardless of compatibility
C. Hangers, supports, and anchors must be strong enough to support the weight of the pipe and contents, and piping must be isolated from incompatible materials
D. Piping needs no isolation from other materials as long as the hangers can bear the weight

27. Based on Section 408.2 regarding water consumption, which of the following statements is correct about showerheads?

A. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute (gpm) at 80 psi
B. Showerheads shall allow a flow rate of up to 2.5 gpm at 60 psi
C. Showerheads have a maximum flow rate requirement of 2.0 gpm at 100 psi
D. Showerheads are not subject to any maximum flow rate limitations regardless of psi

408.5 Finished Curb or Threshold. Where a shower receptor has a finished dam, curb, or threshold, it shall be not less than 1 inch (25.4 mm) lower than the sides and back of such receptor. In no case, shall a dam or threshold be less than 2 inches (51 mm) or exceeding 9 inches (229 mm) in depth where measured from the top of the dam or threshold to the top of the drain. Each such receptor shall be provided with an integral nailing flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment. The flange shall be watertight and extend vertically not less than 1 inch (25.4 mm) above the top of the sides of the receptor. The finished floor of the receptor shall slope uniformly from the sides towards the drain not less than 1/8 inch per foot (10.4 mm/m), nor more than 1/2 inch per foot (41.6 mm/m).

Thresholds shall be of sufficient width to accommodate a minimum 22 inch (559 mm) door. Shower doors shall open so as to maintain not less than a 22 inch (559 mm) unobstructed opening for egress. Where there is a shower without a threshold, the floor space within the same room shall be considered a wet room.

Exceptions:

(1) Showers in accordance with Section 403.2.

(2) A cast-iron shower receptor flange shall be not less than 0.3 of an inch (7.62 mm) in height.

(3) For flanges not used as a means of securing, the sealing flange shall be not less than 0.3 of an inch (7.62 mm) in height.

412.1 Application. Urinals shall comply with ASME A112.19.2/ CSA B45.1, ASME A112.19.19, or CSA B45.5/ IAPMO Z124. Urinals shall have an average water consumption not to exceed 0.5 gallons of water per flush.

412.1.1 Nonwater Urinals. Nonwater urinals shall have a liquid barrier sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Where nonwater urinals are installed, not less than 1 water supplied fixture rated at not less than one water supply fixture unit (WSFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing. Where nonwater urinals are installed, they shall have a water distribution line rough-in to each individual urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.

412.2 Backflow Protection. A water supply to a urinal shall be protected by an approved-type vacuum breaker or other approved backflow prevention device in accordance with Section 603.5.

414.3 Drainage Connection. Domestic dishwashing machines shall discharge in accordance with Section 807.3 through an air gap fitting, into a waste receptor, into a wye branch fitting on the tailpiece of a kitchen sink, or into the dishwasher connection of a food waste disposer. Commercial dishwashing machines shall discharge indirectly through an air break or direct connection. The indirect discharge for commercial dishwashing machines shall be in accordance with Section 807.1, and the direct discharge shall be in accordance with Section 704.3.

415.1 Application. Drinking fountains shall be self-closing and comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4. Drinking fountains and bottle filling stations shall also comply with NSF 61. Permanently installed electric water coolers and bottle filling stations shall also comply with UL 399. Electric water coolers and water heaters connected to potable water that are vented to the atmosphere shall comply with ASSE 1023.

416.5 Drain. Where a drain is provided, the discharge shall be in accordance with Section 811.0.

418.3 Location of Floor Drains. Floor drains shall be installed in the following areas:

(1) Toilet rooms containing two or more water closets or a combination of one water closet and one urinal, Except in a dwelling unit. Floor mounted urinals may be used as a floor drain to meet the requirements of this section.

(2) Commercial kitchens and in accordance with Section 704.3.

(3) Laundry rooms and commercial buildings and common laundry facilities serving three or more dwelling units.

(4) Boiler rooms.

Exam Questions:

28. Based on the requirements for water supply to urinals, which of the following statements is correct?

A A water supply to a urinal must be protected by an approved-type vacuum breaker or other approved backflow prevention device

B A water supply to a urinal does not require backflow protection if used intermittently

C Urinals can be connected directly to the water supply without any backflow prevention device

D Backflow protection for urinals is optional if installed within residential buildings

29. Which of the following requirements must electric water coolers and water heaters connected to potable water that are vented to the atmosphere comply with?

A. They must be vented directly into the building sewer line

B. They shall comply with ASSE 1023

C. They shall comply with ASSE 1016

D. They must have no venting requirements and can be installed without compliance to any standards

30. When a drain is provided for installations requiring compliance, which section must the discharge adhere to?

A. Section 902.1

B. Section 820.5

C. Section 811.0

D. Section 700.4

420.2 Water Consumption. Sink faucets shall have a maximum flow rate of not more than 1.8 gpm at 60 PSI.

Exceptions:

(1) Clinical sinks

(2) Laundry trays

(3) Service sinks

420.3 Pre-Rinse Spray Valve. Commercial food service pre-rinse spray valves shall have a maximum flow rate of 1.28 gallons per minute (gpm) and shall be equipped with an integral automatic shutoff.

422.0 Minimum Number of Required Fixtures. The minimum number of required fixtures shall be in accordance with the Building Code.

501.1 Applicability. The regulations of this chapter shall govern the construction, location, and installation of fuel burning, instantaneous and other types of water heaters heating potable water. The minimum capacity for storage water heaters shall be in accordance with the first-hour rating listed in Table 501.1(2). No water heater shall be hereinafter installed that does not comply with the manufacturer's installation instructions and the type and model of each size thereof approved by the State Plumbing Board. A list of accepted water heater appliance standards is referenced in Table 501.1(1). Listed appliances shall be installed in accordance with the manufacturer's installation instructions. Unlisted water heater shall be permitted in accordance with Section 505.3.2.

502.1 Direct Vent Water Heaters. Water heaters that are constructed and installed so that air for combustion is derived directly from the outside atmosphere and all flue gases are discharged to the outside atmosphere.

502.2 Hot Water Supply Boiler. A storage type potable water heating unit exceeding any of the perimeters of Section 502.3. A hot water supply boiler is regulated by the Boiler Code.

502.3. Storage Type Water Heaters. Storage type water heaters regulated by this code are appliances which heat potable water and are equipped with approved safety devices and operate at or below the following:

(1) Volume of 120 gallons

(2) Water temperature of 210°F

(3) One hundred fifty pounds-force per square inch operating pressure; and

(4) Two hundred Thousand British thermal units (BTU) (58.6 kW*h) input

Exception: Potable water heaters designed to create hot water instantaneously on demand without the use of a storage tank.

502.4 Indirect-Fired Water Heater. A water heater consisting of a storage tank equipped with an internal or external heat exchanger used to transfer heat from an external source to heat potable water. The storage tank either contains heated potable water or water supplied from an external source, such as a boiler.

502.5 Water Heater. An appliance for supplying hot water for domestic or commercial purposes.

502.6 Instantaneous-Tankless Water Heater. Potable water heating units, sometimes with a small buffer tank, designed to create hot water instantaneously on demand without the use of a storage tank, regardless of size or BTU input, and shall be listed per Chapter 17.

503.1 General. It shall be unlawful for a person to install, remove, or replace or cause to be installed, removed, or replaced a water heater without first obtaining a permit from the Building Official to do so.

504.1 Final Water Heater Inspection. This inspection shall be made after work authorized by the permit has been installed. The Building Official will make such inspection to be assured that the work has been installed in accordance with the intent of this code.

505.1 Location. Water heater installations in bedrooms and bathrooms shall comply with one of the following:

(1) Water heater shall be of the direct vent type.

(2) Fuel burning water heater shall be permitted to be installed in a closet located in the bedroom or bathroom, provided the closet is equipped with a listed, gasketed door assembly and a listed self-closing device. The self-closing door assembly shall meet the requirements of Section 505.1.1. The door assembly shall be installed with a threshold and bottom door seal and shall meet the requirements of Section 505.1.2. Combustion air for such installation shall be obtained from the outdoors in accordance with the Mechanical Code. The closet shall be for the exclusive use of the water heater.

Exam Questions:

31. What is the maximum flow rate for commercial food service pre-rinse spray valves, as specified in Section 420.3?

A. 1.75 gpm
B. 1.28 gpm
C. 2.0 gpm
D. 1.5 gpm

32. According to Section 422.0, what determines the minimum number of required fixtures?

A. The building code
B. The local zoning ordinance
C. The contractor's specifications
D. The manufacturer's recommendations

33. Which of the following best describes a storage type water heater as regulated by the code?

A. It is an appliance that heats non-potable water, requires no safety devices, and operates at any volume, temperature, pressure, and input
B. It is an appliance that heats potable water, has approved safety devices, and operates at or below 120 gallons volume, 210°F temperature, 150 psi pressure, and 200,000 BTU input
C. It is a tankless water heater that does not store water and is not subject to volume, temperature, pressure, and input limitations
D. It is a portable water heater specifically designed for outdoor applications, operating at low pressure and high BTU input

34. What is required before installing, removing, or replacing a hot water heater according to the code?

A. Notifying the local fire department
B. Hiring a licensed master plumber
C. Obtaining a permit from the Building Official
D. Conducting a safety inspection by the water utility company

35. When installing a fuel-burning water heater in a closet within a bedroom or bathroom, where must the combustion air be obtained from according to the Mechanical Code?

A. From the outdoors
B. From the room the closet is located in
C. From a shared air source with other appliances
D. From an indoor mechanical ventilation system

505.1.2 Gasketing. Gasketing on gasketed doors or frames shall be furnished in accordance with the published listings of the door, frame, or gasketing material manufacturer.

Exception: Where acceptable to the Building Official, gasketing of non-combustible or limited-combustible material shall be permitted to be applied to the frame, provided closing and latching of the door are not inhibited.

505.3.2 Unlisted Water Heaters. Except as otherwise permitted in this code, unlisted water heaters shall be approved by the Building Official prior to being installed. Clearance for unlisted water heaters shall be not less than 12 inches on all sides. Combustible floors under unlisted water heaters shall be protected in an approved manner.

505.6 Temperature, Pressure, and Vacuum Relief Devices. Temperature, pressure, and vacuum relief devices or combinations thereof shall be installed in accordance with the terms of their listings and the manufacturers installation instructions. A shuttle valve shall not be placed between the relief valve and the water heater or on discharge pipes between such valves and the atmosphere. The hourly British thermal units discharge capacity or the rated steam relief capacity of the device shall not be less than the input rating of the water heater. Discharge piping shall be installed in accordance with Section 608.5.

506.1 Water Heaters. Water heaters deriving heat from fuels or types of energy other than gas shall comply with the standards referenced in Table 501.1(1), or Section 506.3. Vents or chimneys for such appliances shall be of approved types. An adequate supply of air for combustion and for adequate ventilation of heater rooms or compartments shall be provided. Each such appliance shall be installed in a location in accordance with the requirements of this code.

506.3 Indirect-Fired Water Heaters. Indirect fired water heaters shall be in accordance with the applicable sections of the Boiler Code or shall comply with one of the other applicable standards shown in Table 501.1(1). Each water heater shall bear a label in accordance with ASME requirements, or an approved testing agency, certifying and attesting that such an appliance has been tested, inspected and meets the requirements of the applicable standards or code.

507.2 Seismic Provisions. Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one-third and lower one-third of its vertical dimensions. At the lower point, a distance of not less than 4 inches (102 mm) shall be maintained from the controls with the strapping.

Exception: Water heaters in one- and two-family dwellings and townhouses in Seismic Design Category B and C are not required to be strapped or anchored to resist horizontal displacement due to earthquake motion.

507.4 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than 3/4 of an inch

(20 mm) diameter drain to an approved location. Such pan shall be not less than 1 1/2 inches (38 mm) in depth.

(1) Replacement of an existing water heater shall not require a water heater pan or drain unless one already exists.

(2) Instantaneous water heaters.

507.5 Flammable Vapors. Appliances shall not be installed in areas where the open use, handling, or dispensing of flammable liquids occurs, unless the design, operation, or installation reduces the potential of ignition of the flammable vapers. Water heaters installed in compliance with Sections 507.6 through Section 507.8 shall be considered to comply with the intent of this provision.

507.6 Installation in Residential Garages. Fuel gas water heaters in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners and burner-ignition devices are located not less than 18 inches above the floor unless listed as flammable vapor ignition resistant.

507.6.1 Physical Damage. Fuel, gas water heaters installed in garages, warehouses, or other areas subject to mechanical damage shall be guarded against such damage by being installed behind protective barriers in accordance with the Mechanical Code or by being elevated or located out of the normal path of vehicles.

Exam Questions:

36. According to Section 505.3.2 of the code, what is required for the installation of unlisted water heaters?

A. Approval by the Building Official prior to installation is necessary
B. Installation can proceed without any approvals if the heater is brand new
C. They must be installed with no more than 6 inches of clearance
D. No specific approval is needed, but they must be installed outdoors

37. According to Section 505.6, which of the following is true about the installation of temperature, pressure, and vacuum relief devices on water heaters?

A. Relief devices can have shuttle valves as long as they are within 12 inches of the water heater
B. The hourly British thermal units discharge capacity can be less than the input rating of the water heater
C. The devices do not need to follow the manufacturers' installation instructions
D. Shuttle valves must not be placed between the relief valve and the water heater or on discharge pipes

38. Based on Section 507.2, which of the following statements is true regarding seismic provisions for water heaters?

A. Strapping is only required at the midpoint of the water heater's vertical dimension
B. Water heaters do not need any special anchoring in areas prone to earthquakes
C. Water heaters must be anchored or strapped to resist horizontal displacement due to earthquake motion
D. The lower strapping point must be directly below the controls, with no minimum distance required

39. Based on Section 507.5, which of the following statements is true regarding the installation of appliances in areas with flammable vapors?

A. Appliances should not be installed in areas where flammable liquids are openly used, handled, or dispensed unless specific safety measures are in place to prevent ignition
B. Installing a water heater in a garage automatically meets the compliance requirements for areas with flammable vapors
C. Appliances can be freely installed in areas with flammable liquids if the installation space is ventilated
D. The presence of flammable vapors does not affect the installation requirements for any appliances, regardless of their design

40. Based on Section 507.6.1, which of the following statements correctly describes the installation requirements for fuel gas water heaters in garages or areas prone to mechanical damage?

A. Fuel gas water heaters in garages should be installed on the floor to avoid mechanical damage
B. Fuel gas water heaters in garages only need to be protected if they are located directly in the path of vehicles
C. There are no specific installation requirements for protecting fuel gas water heaters in garages from mechanical damage
D. Fuel gas water heaters in garages must be protected against mechanical damage by being installed behind protective barriers, elevated, or located out of the normal path of vehicles

41. In which seismic design categories are water heaters in one- and two-family dwellings and townhouses NOT required to be strapped or anchored to resist horizontal displacement due to earthquake motion?

A. Category A only
B. Categories D and E
C. Categories B and C
D. Categories E and F

507.6.2 Access From the Outside. Where fuel gas water heaters are installed in a separate, enclosed space having access only from outside of the garage, such appliances shall be permitted to be installed at floor level, providing the required combustion air is taken from the exterior of the garage.

507.7 Installation in Commercial Garages. Fuel gas water heaters installed in commercial garages shall comply with Section 507.7.1 and Section 507.7.2.

507.7.1 Parking Structures. Fuel gas water heaters installed in enclosed, basement, and underground parking structure shall be installed in accordance with the Mechanical Code.

507.7.2. Repair Garages. Fuel gas water heaters installed in repair garages shall be installed in accordance with the provisions of the Mechanical Code.

507.8 Installation in Aircraft Hangers. Heaters in aircraft hangers shall be installed in accordance with NFPA 409.

507.9 Installation Instructions. The installer shall conform to the appliance and equipment manufacturers recommendations in completing an installation. The installer shall leave the manufacturers installation, operating, and maintenance instructions in a location on the premises where they are readily available for reference and guidance of the Building Official, service personnel, and the owner or operator.

508.1 Water Heaters on Roofs. Water heaters located on roofs or other elevated locations shall be accessible.

508.1.1 Access. Buildings of more than 15 feet in height shall have an inside means of access to the roof, unless other means acceptable to the Building Official are used.

508.2 Water Heaters in Attics and Under-Floor Spaces. An attic or under-floor space in which a water heater is installed shall be accessible through an opening and passageway, not less than as large as the largest component of the appliance, and not less than 22 inches by 30 inches.

601.2 Water Supply and Flushing. Each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed using an approved flush tank or flushometer valve.

Exceptions:

(1) Listed fixtures that do not require water for their operation and are not connected to the water supply.

(2) Where not deemed necessary for safety and sanitation by the Building Official.

602.4 Approval by Authority. No water piping supplied by a private water supply system shall be connected to any other source of supply without the approval of the Building Official, Oregon Health Authority, or other department having jurisdiction.

Exam Questions:

42. Based on Section 507.7, which of the following correctly describes the requirement for installing fuel gas water heaters in commercial garages?

A. In commercial garages, fuel gas water heaters are not allowed to be installed at all
B. Fuel gas water heaters can be installed in any area of a commercial garage without additional requirements
C. Only Section 507.7.2 applies to the installation of fuel gas water heaters in commercial garages
D. Fuel gas water heaters installed in commercial garages must comply with both Section 507.7.1 and Section 507.7.2

43. Based on Section 507.7.2, how should fuel gas water heaters be installed in repair garages?

A. Only portable fuel gas water heaters are allowed in repair garages, with no installation requirements
B. Fuel gas water heaters should not be installed in repair garages under any circumstances
C. Fuel gas water heaters can be installed in repair garages without any specific guidelines or codes
D. Fuel gas water heaters in repair garages must be installed in accordance with the provisions of the Mechanical Code

44. Based on Section 507.8, how should heaters be installed in aircraft hangars?

A. Heaters in aircraft hangars must be installed in accordance with NFPA 409
B. Heaters in aircraft hangars should be installed according to the electrical code only
C. Heaters in aircraft hangars can be installed without following any specific standards
D. Heaters in aircraft hangars should be installed based on manufacturer recommendations alone

45. What requirement must be met for water heaters located on roofs or other elevated locations?

A. Water heaters do not need any special requirements if placed on roofs
B. Water heaters must be accessible
C. Water heaters should be made from lightweight materials if they are on roofs
D. Water heaters must be installed indoors and are not allowed on roofs

46. What are the requirements for accessibility when installing a water heater in an attic or under floor space?

A. The space must have an external access door directly to the outside with a minimum size of 36 inches by 36 inches
B. The space must be accessible through an opening and passageway that is at least as large as the largest component of the appliance, and not less than 22 inches by 30 inches
C. The space must be accessed by a pull-down ladder and have a passageway that is at least 20 inches wide
D. There are no specific size requirements for access openings when installing a water heater in an attic or under floor space

47. Based on Section 601.2, which of the following is a requirement for the water supply and flushing of plumbing fixtures?

A. Every fixture must be drained with a gravity-fed system to ensure proper sanitation and operation
B. Plumbing fixtures should have a dedicated hot water supply line for flushing purposes to maintain cleanliness
C. Each plumbing fixture must be provided with an adequate supply of potable running water arranged to flush and keep it clean and sanitary, without danger of backflow or cross connection
D. All plumbing fixtures must use only recycled water for flushing to promote eco-friendly practices

48. Which of the following is required before connecting a private water supply system to another source of water?

A. Approval must be obtained from the Building Official, Oregon Health Authority, or other department having jurisdiction
B. An inspection must be conducted by a certified private inspector
C. A survey must be completed by a licensed civil engineer
D. A certificate of compliance must be issued by the federal Environmental Protection Agency

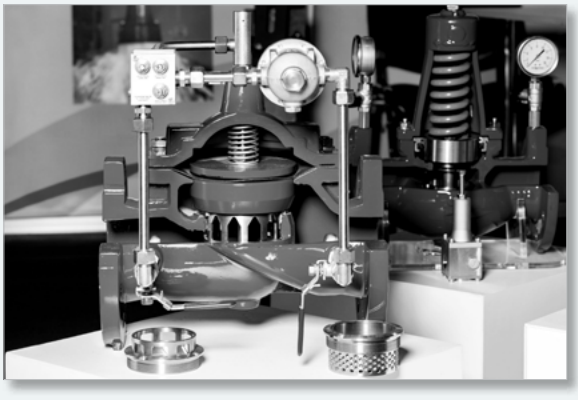
603.2 Approval of Devices or Assemblies. Before a device or an assembly is installed for the prevention of backflow, it shall have first been approved by the Building Official, Building Codes Division, or the State Plumbing Board. Devices or assemblies shall be tested in accordance with recognized standards or other standards acceptable to the Building Official, Building Codes Division, or State Plumbing Board. Backflow prevention devices and assemblies shall comply with Table 603.2, except for specific applications and provisions as stated in Section 603.5.1 through Section 603.5.21.

Devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such devices or assemblies shall be tested at the time of installation.

603.4 General Requirements. Assemblies shall comply with listed standards and be acceptable to the Building Official, in accordance with the requirements of this code.

603.4.1 Backflow Prevention Valve. Where more than one backflow prevention valve is installed on a single premise, and the valves are installed in one location, each separate valve shall be permanently identified by the permittee in a manner satisfactory to the Building Official.

603.4.2 Testing. The premise owner or responsible person shall have the backflow prevention assembly tested at the time of installation.



603.4.9 Prohibited Locations. Backflow preventers shall not be located in an area containing fumes that are toxic, poisonous, or corrosive.

603.5.6 Protection from Lawn Sprinklers and Irrigation Systems. Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical injection or provisions for chemical injection, shall be protected from backflow by one of the following devices:

(1) Atmospheric vacuum breaker (AVB)

(2) Pressure vacuum breaker backflow prevention assembly (PVB)

(3) Spill resistant pressure vacuum breaker (SVB)

(4) Reduced-pressure principle backflow prevention assembly (RP)

(5) Double check valve backflow prevention assembly (DC)

(6) A valve complying with IAPMO PS 72

603.5.6.2 Systems with Backflow Devices. Where systems have a backflow device installed downstream from a potable water supply pump or a potable water supply pump connection, the device shall be one of the following:

(1) Atmospheric vacuum breaker (AVB)

(2) Pressure vacuum breaker backflow prevention assembly (PVB)

(3) Spill resistant pressure vacuum breaker (SVB)

(4) Reduced-pressure principle backflow prevention assembly (RP)

(5) Double check valve backflow prevention assembly (DC)

603.5.11 Nonpotable Water Piping. In cases where it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a nonpotable water line. No drinking or domestic water outlets shall be connected to the nonpotable water line. Where possible, portions of the nonpotable water line shall be exposed, and exposed portions shall be properly identified in accordance with this code. Each outlet on the nonpotable waterline that is permitted to be used for drinking or domestic purposes shall be posted: "CAUTION: NONPOTABLE WATER, DO NOT DRINK."

603.5.17 Potable Water Outlets and Valves. Potable water outlets, freeze proof yard hydrants, combination stop and waste valves, or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground.

Exception: External vertical yard hydrants shall be of the self-draining sanitary type or be provided with a dual check backflow preventer in accordance with ASSE 1024.

604.10 Plastic Materials. Approved plastic materials shall be permitted to be used in building supply piping, provided that where metal building supply piping is used for electrical grounding purposes, replacement piping, therefore, shall be of like materials.

Exception: Where a grounding system is installed, inspected, and approved in accordance with the Electrical Code, metallic pipe shall be permitted to be replaced with nonmetallic pipe.

604.13 Water Heater Connectors. Flexible metallic (copper and stainless steel), reinforced flexible, braided stainless steel, or polymer braided with EPDM core connectors that connect a water heater to the piping system shall comply with ASME A112.18.6/CSA B125.6. Copper, copper alloy, or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a water heater.

Exception: CPVC, PE-RT, PEX, or PP tubing accordance with the manufacturers installation instructions and approved for hot and cold potable water distribution in accordance with Table 604.1, shall be permitted to be installed within the first 18 inches of piping connected to an instantaneous on-demand tankless water heater.

Exam Questions:

49. What requirement is specified for the identification of backflow prevention valves installed in one location?

A. Each valve must be colored-coded according to industry standards
B. Each separate valve must be permanently identified by the permittee in a manner satisfactory to the Building Official
C. Each valve should be registered with the local water authority
D. Each valve must have a detachable identification tag provided by the manufacturer

50. When must the premise owner or responsible person have the backflow prevention assembly tested?

A. At the time of installation
B. Once every five years
C. During the annual inspection
D. Before purchasing the assembly

51. Where is it prohibited to locate backflow preventers according to Section 603.4.9?

A. In a publicly accessible outdoor location
B. Near a kitchen or food preparation area
C. Above a ceiling with electrical wiring
D. In an area containing fumes that are toxic, poisonous, or corrosive

52. Which of the following devices can protect potable water supplies from backflow in lawn sprinkler and irrigation systems with no pumps or chemical injection?

A. Atmospheric vacuum breaker (AVB)
B. Siphon check valve
C. Reverse osmosis system
D. Carbon filtration unit

53. Which device can be installed downstream from a potable water supply pump or connection to protect against backflow?

A. Thermal expansion tank
B. Centrifugal pump reducer
C. Atmospheric vacuum breaker (AVB)
D. Ion exchange resin system

54. Based on Section 603.5.11, what should be done with nonpotable water lines to ensure safety and compliance?

A. They should have a standard blue color coding to distinguish them from potable water lines
B. They should be exposed where possible and clearly identified, with outlets posted: "CAUTION: NONPOTABLE WATER, DO NOT DRINK."
C. They should be buried underground to prevent accidental use for drinking
D. They should automatically be connected to a water purification system to treat the water

55. Which of the following statements is true regarding the use of plastic materials in building supply piping?

A. Plastic materials are not permitted for use in building supply piping under any circumstances
B. Approved plastic materials can be used for building supply piping, but if the metal piping is being used for electrical grounding, any replacement piping must also be metal
C. Plastic materials can be used in building supply piping and for electrical grounding purposes
D. Replacement piping for metal supply lines used for electrical grounding can be made of any material as long as it is insulated

56. Which of the following statements is true regarding the installation of certain types of tubing connected to an instantaneous on-demand tankless water heater?

A. CPVC, PE-RT, PEX, or PP tubing can only be used for external connections and not within the first 18 inches of piping attached to an instantaneous on-demand tankless water heater

B. Only copper tubing is permitted within the first 18 inches of piping connected to an instantaneous on-demand tankless water heater

C. No specific installation instructions are required for the first 18 inches of piping connected to an instantaneous on-demand tankless water heater

D. CPVC, PE-RT, PEX, or PP tubing approved for hot and cold potable water distribution can be installed within the first 18 inches of piping connected to an instantaneous on-demand tankless water heater according to the manufacturer's installation instructions and Table 604.1

605.2.2 Solvent Cement Joints. Solvent cement joints for CPVC pipe and fittings shall be clean from dirt and moisture. Solvent cements shall comply with ASTM F493, requiring the use of a primer shall be orange in color. The primer shall be colored and shall comply with ASTM F656. Listed solvent submit that complies with ASTM F493 and that does not require the use of primers, yellow, green, or red in color, shall be permitted for pipe and fittings that comply with ASTM D2846, ½ of an inch through 2 inches in diameter or ASTM F442, ½ of an inch through three inches in diameter. Apply primer where required inside the fitting and to the depth of the fitting on pipe. Apply liberal coat of cement to the outside surface of pipe to depth of fitting and inside of fitting. Place pipe inside fitting to forcefully bottom the pipe in the socket and hold together until joint is set.

605.15 Dielectric Unions. Dielectric unions where installed at points of connection where there is a dissimilarity of metals shall be in accordance with ASSE 1079 or IAPMO PS 66.

605.16.1 Copper or Copper Alloy Pipe or Tubing to Threaded Pipe Joints. Joints from copper or copper alloy pipe or tubing to threaded pipe shall be made using copper alloy adapter, copper alloy nipple [minimum 6 inches (152 mm)], dielectric fitting, or dielectric union in accordance with ASSE 1079 or IAPMO PS 66. The joint between the copper or copper alloy pipe or tubing and the fitting shall be a soldered, brazed, flared, or press-connect joint and the connection between the threaded pipe and the fitting shall be made with a standard pipe size threaded joint.

605.16.3 Stainless Steel to Other Materials. Where connecting stainless steel pipe to other types of piping, mechanical joints of the compression type, dielectric fitting, or dielectric union in accordance with ASSE 1079 or IAPMO PS 66 and designed for the specific transition intended shall be used.

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems

shall comply with ASSE 1003. Pressure regulator(s) equal to or exceeding 11/2 inches (40 mm) shall not require a strainer. Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Building Official. Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with adequate means to provide drainage a properly sized and shall be protected from freezing and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping.

Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4.

An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized, securely fastened, and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.

608.3 Expansion Tanks, and Combination Temperature and Pressure-Relief Valves. A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Prepressurized water expansion tanks shall comply with IAPMO Z1088. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized, securely fastened, and installed in accordance with the manufacturer's installation instructions.

A water system containing storage water heating equipment shall be provided with an approved, listed, adequately sized combination temperature and pressure-relief valve, except for listed nonstorage instantaneous heaters having an inside diameter of not more than 3 inches (80 mm). Each such approved combination temperature and pressure-relief valve shall be installed on the water-heating device in an approved location based on its listing requirements and the manufacturer's installation instructions. Each such combination temperature and pressure-relief valve shall be provided with a drain in accordance with Section 608.5.

Exception: An expansion tank shall not be required for an instantaneous on-demand water heater.

Exam Questions:

57. Which of the following statements is true regarding the application of primer when joining pipes and fittings?

A. Primer should be applied inside the fitting and to the depth of the fitting on the pipe where required
B. Primer application is only necessary on the outside of both pipe and fitting
C. Primer should be applied only to the pipe surface, not the fitting
D. Primer is not necessary if the fitting and pipe are of the same material

58. Which of the following statements is true regarding dielectric unions?

A. Dielectric unions do not need to meet any standards when connecting dissimilar metals
B. Dielectric unions must be installed at points of connection where there is a dissimilarity of metals, in accordance with ASSE 1079 or IAPMO PS 66
C. Dielectric unions are only required when connecting the same types of metal
D. Dielectric unions should be installed at every joint regardless of metal type, adhering to any standard

59. How should joints from copper or copper alloy pipe or tubing to threaded pipe be made?

A. By using direct threading without any intermediary fitting
B. By using a plastic adapter without any specified standard
C. By using a copper alloy adapter, copper alloy nipple (minimum 6 inches), dielectric fitting, or dielectric union in accordance with ASSE 1079 or IAPMO PS 66
D. By applying a soldered connection directly between the pipes

60. What should be done if the static water pressure in the water supply piping exceeds 80 psi?

A. The water supply should be turned off until the pressure drops below 80 psi (552 kPa)
B. An approved-type pressure regulator preceded by an adequate strainer should be installed to reduce the static pressure to 80 psi (552 kPa) or less
C. Additional piping should be added to distribute the pressure more evenly
D. The pipes should be replaced with thicker pipes that can withstand higher pressure

61. What requirement must be met for a water system equipped with a check valve, backflow preventer, or any device preventing building pressure dissipation back into the water main?

A. The water system should be regularly inspected every six months
B. It must be provided with an approved, listed, and adequately sized expansion tank or similar device to control thermal expansion
C. Only cold water should be used in systems with these features
D. The water heater must be replaced annually to ensure safety

609.7 Abutting Lot. Nothing contained in this code shall be construed to prohibit the use of an abutting lot, provided documentation of a legal easement for access to connect a building supply is submitted to the Building Official.

609.11 Water Hammer. Building water supply systems where quick-acting valves are installed shall be provided with water hammer arrester(s) to absorb high pressures resulting from the quick closing of these valves. Water hammer arresters shall be approved mechanical devices that comply with ASSE 1010 or PDI-WH 201 and shall be installed as close as possible to quick-acting valves.

Exception: This section shall not apply to one- and two-family dwellings or townhouses.

612.1 Where Required. Where residential multipurpose sprinkler systems are required in one- and two-family dwellings or townhouses, the system shall be installed in accordance with NFPA 13D in Chapter 17.

Table 703.2

Footnote 7: Was revised to provide clarity on the permitted number of drainage fixtures for one to eight public lavatories.

Up to 8 public lavatories are permitted to be installed on a 11⁄2 inch (40 mm) vertical branch or horizontal sanitary branch sloped at 1⁄4 inch per foot (20.8 mm/m). Up to 8 public lavatories shall not exceed a total of 2 drainage fixture units.

705.6.2 Solvent Cement Joints. Solvent cement joints for PVC pipe and fittings shall be clean from dirt and moisture. Pipe shall be cut square, and pipe shall be debarred. Where surfaces to be joined are clean and free of dirt, moisture, oil, and other foreign material, apply primer purple in color that complies with ASTM F656. Primer shall be applied to the surface of the pipe and fitting is softened. Solvent submit that comply with ASTM D2564 shall be applied to all joint surfaces. Joints shall be made while both the inside socket surface and outside surface of pipe are wet with solvent cement. Hold joint in place and undisturbed for 1 minute after assembly.

Exception: Listed solvent cements that do not require the use of primer with PVC/DWV non-pressure systems and installed per the manufacturer's installation instructions.

705.10.3 Plastic Pipe to Other Materials. Where connecting plastic pipe to other types of plastic or other types of piping material; approved listed adapter or transition fittings and listed for the specific transition intended shall be used. Except as provided in Section 705.9.4, PVC and ABS pipe and fittings shall not be solvent welded to any other unlike material.

707.9 Clearance. Each cleanout in piping 2 inches (50 mm) or less in size shall be so installed that there is a clearance of not less than 18 inches (457 mm) by 18 inches (457 mm) in front of the cleanout. Cleanouts in piping exceeding 2 inches (50 mm) shall have a clearance of not less than 24 inches (610 mm) by 24 inches (610 mm) in front of the cleanout. Cleanouts in under-floor piping shall be extended to or above the finished floor or shall be extended outside the building where there is less than 18 inches (457 mm) vertical overall, allowing for obstructions such as ducts, beams, and piping, and 30 inches of (762 mm) horizontal clearance from the means of access to such cleanout.

708.1 General. Horizontal drainage piping shall be run in practical alignment and a uniform slope of not less than 1/4 inch per foot or 2% toward the point of disposal provided that, where it is impractical due to the depth of the street sewer, to the structural features, or to the arrangement of a building or structure to obtain a slope of 1/4 inch per foot or 2%, such pipe or piping 4 inches or larger in diameter shall be permitted to have a slope of not less than 1/8 inch per foot or 1%, were first approved by the Building Official.

Exam Questions:

62. When residential multi-purpose sprinkler systems are required in one and two-family dwellings or townhouses, how should they be installed?

A. With standard garden hose connections for flexibility
B. By using any locally preferred method without specific standards
C. Only in basements and attics to conserve water
D. In accordance with NFPA 13D as specified in Chapter 17

63. According to Section 705.6.2, what steps must be taken before joining PVC pipes?

A. Only pipes need to be dry, and they can have rough cuts
B. Pipes can have some moisture, but they should be clean and cut at any angle
C. Fittings require no cleaning, but pipes should be debarred
D. Pipes must be clean from dirt and moisture, cut square, and debarred

64. What is the specified restriction for solvent welding PVC and ABS pipe and fittings?

A. PVC pipe can be solvent welded to ABS pipe without restriction
B. PVC and ABS pipe and fittings shall not be solvent welded to any other unlike material, except as provided in Section 705.9.4
C. ABS pipe can be solvent welded to any material, but PVC cannot
D. PVC and ABS pipe and fittings can be solvent welded to all other material types without exception

65. According to the code regarding cleanouts in piping exceeding 2 inches, what is the minimum required clearance in front of the cleanout?

A. Not less than 30 inches by 30 inches
B. Not less than 18 inches by 18 inches
C. Not less than 24 inches by 24 inches
D. Not less than 12 inches by 12 inches

66. According to the code for horizontal drainage piping, what is the minimum uniform slope required for pipes 4 inches or larger in diameter, when a 1/4 inch per foot slope is impractical due to specific conditions?

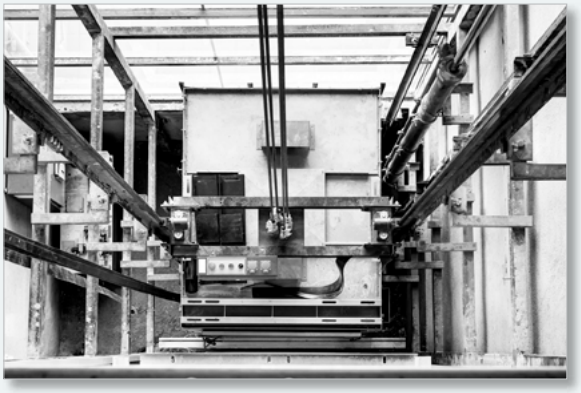
A. 1/8 inch per foot or 1%
B. 1/16 inch per foot or 0.5%
C. 1/2 inch per foot or 4%
D. 3/8 inch per foot or 3%

710.4 Discharge Line. The discharge line from such ejector, pump, or another mechanical device shall be of approved pressure rated material and be provided with an accessible backwater or swing check valve and gate or ball valve. Fittings shall be a fullway type, shall not restrict flow, and shall be approved for use with the pressure discharge piping. Where the gravity drainage line to which such discharge line connects is horizontal, the method of connection shall be from the top through a wye branch fitting. The gate or ball valve shall be located on the discharge side of the backwater or check valve.

Gate or ball valves, where installed in drainage piping, shall be fullway type with working parts of corrosion-resistant metal. Sizes 4 inches (100 mm) or more in diameter shall have cast-iron bodies and sizes less than 4 inches (100 mm), cast-iron or copper alloy bodies.

710.6 Backwater Valves. Backwater valves, gate valves, fullway ball valves, unions, motors, compressors, air tanks, and other mechanical devices required by this section shall be located where they will be accessible for inspection and repair and, unless continuously exposed, shall be enclosed in a masonry pit fitted with an adequately sized removable cover.

Backwater valves shall comply with ASME A112.14.1, or IAPMO IGC 305 and have bodies of cast-iron, plastic, copper alloy, or other approved materials; shall have noncorrosive bearings, seats, and self-aligning discs; and shall be constructed to ensure a positive mechanical seal. Such backwater valves shall remain open during periods of low flows to avoid screening of solids and shall not restrict capacities or cause excessive turbulence during peak loads. Unless otherwise listed, valve access covers shall be bolted type with gasket, and each valve shall bear the manufacturer's name cast into the body and the cover.



710.14 Elevator Pit Drains. Permanent means of drainage shall be provided for each elevator car. Gravity drains, when installed, shall people be provided with an approved-type backwater valve to prevent drain line backup and the trap seal shall be protected with an automatic trap seal primer. Sumps and pumps may be installed when provided with the following:

(1) A check valve to prevent water, gases, and outdoors from entering the pit.

(2) A secure and level cover over the sump.

(3) An automatic activation switch.

(4) A minimum 50 GPM pump per each elevator car.

(5) A minimum 2-inch discharge pipe.

(6) Sump size as recommended by the pump manufacturer.

(7) The outlet pipe of the pump shall be directly or indirectly connected to the sanitary drainage system.

(8) Single pumps shall be permitted.

(9) A minimum 4-inch receiving gravity drain at 1/4 inch per foot slope or 2% shall serve the branch connected through the trap.

(10) Dual pumps and oil water separator are not required.

714.2 Prohibited Water Discharge. No rain, surface, or sub surface water shall be connected to or discharged into a drainage system unless first approved by the Building Official.

714.4. Commercial Food Waste Disposer. The Building Official shall review before approval, the installation of a commercial food waste disposer connecting to a private sewage disposal system.

714.5 Tanks. An approved type, watertight sewage or wastewater holding tank, the contents of which, due to their character, shall be periodically removed and disposed of where required to prevent anticipated surface or subsurface contamination or pollution, damage to the public, sewer, or other hazardous or nuisance conditions.

Exam Questions:

67. According to the code regarding gate or ball valves installed in drainage piping, what type of body material is required for valves with a size of 4 inches or more in diameter?

A. Stainless steel bodies
B. Copper alloy bodies
C. Cast-iron bodies
D. Bronze bodies

68. What type of access covers are required for valves unless otherwise listed?

A. Hinged type without gasket
B. Bolted type with gasket
C. Welded type with sealant
D. Screw-on type without seal

69. What is required before installing a commercial food waste disposer that connects to a private sewage disposal system?

A. Installation of a grease trap
B. Review and approval by the Building Official
C. Certification by an environmental engineer
D. Submission of a waste analysis report

1006.2 Vents Not Required. Traps for floor drains, floor sinks, funnel drains, area drains, catch basins and receptors within a building discharging to a vented horizontal soil or waste pipe are exempt from the provision requiring individual vents for each trap, provided that the trap arm, or distance from the trap to the vented horizontal soil or waste pipe to which it discharges, measuring the developed length, does not exceed the maximum distances as shown in Table 1006.2, and that the branch waste pipe from the trap connects to a soil or waste pipe which is vented with a pipe having a diameter not less than that which would be required to vent a floor drain, floor sink, funnel drain, area drain, catch basin and receptors, computed on the units allowed in Table 702.1 and Table 703.2. Common vent sizing shall be the sum of fixture units served, but in no case smaller than the minimum vent size required for any fixture served or as determined from Table 703.2, whichever is larger.

Exception: Floor sinks installed to receive the discharge waste from sinks shall be permitted to be individually vented. Trap arms shall not exceed distances as per Table 1006.2. Priming of traps for above vented floor sinks are not required.

1101.4.2 Location. Building storm sewers located 2 feet (610 mm) or more away from any building or property line, except roads, streets or alleys, shall be of cast iron, vitrified clay, concrete, asbestos cement, ABS, PVC, CPE, or other pipe meeting applicable standards in Table 701.2, Table 1101.4.9, and Chapter 17. Fittings shall be in accordance with Section 706.0 of this code.

1101.4.3 Cleanouts. Cleanouts shall be required and shall be installed as per Section 719.0 of this code.

1101.4.8 Fittings. Sanitary tee branch fittings and 90-degree medium turns shall be permitted for interior and exterior storm drain piping.

Exception: Approved taps shall be permitted on storm sewers per manufacturer's listing.

1312.4 Vacuum Filtration. Central supply systems for vacuum shall be provided with inlet filtration with the following characteristics:

(1) Filtration shall be at least duplex to allow one filter to be exchanged without impairing vacuum system.

(2) Filtration shall be located on the patient side of the vacuum producer.

(3) Filters shall be efficient to 0.3 µ and 99.97 percent HEPA or better, per DOE-STD-3020.

(4) Filtration shall be sized for 100 percent of the peak calculated demand while one filter or filter bundle is isolated.

(5) It shall be permitted to group multiple filters into bundles to achieve the required capacities.

(6) The system shall be provided with isolation valves on the source side of each filter bundle and isolation valves on the patient side of each filter or filter bundle, permitting the filters to be isolated without shutting off flow to the central supply system.

(7) A means shall be available to allow the user to observe any accumulation of liquids.

(8) A vacuum relief petcock shall be provided to allow vacuum to be relieved in the filter canister during filter replacement.

(9) Filter elements and canisters shall be permitted to be constructed of materials as deemed suitable by the manufacturer.

1314.5 Valve Types. New or replacement valves shall be permitted to be of any type as long as they meet the following conditions:

(1) They have a minimum Cv factor in accordance with Table 1314.5.1 or Table 1314.5.2.

(2) They use a quarter turn to off.

(3) They are constructed of materials suitable for the service.

(4) They are provided with copper tube extensions by the manufacturer for brazing or with corrugated medical tubing (CMT) fittings.

(5) They indicate to the operator if the valve is open or closed.

(6) They permit in-line serviceability.

(7) They are cleaned for oxygen service by the manufacturer if used for any positive-pressure service.

(8) They have threaded purge ports on the patient side and the source side.

(9) They have a minimum working pressure equal to or greater than the relief valve protecting the piping system on which the valve is installed for any positive-pressure service.

1323.14 Identification of Shutoff Valves. Shutoff valves shall be identified with the following:

(1) Name or chemical symbol for the specific medical gas or vacuum system.

(2) Room or areas served.

(3) Caution to not close or open valve except in emergency.

(4) Gas or vacuum system color code in accordance with Table 1305.1.

1327.1 General. Dental gas and vacuum systems shall comply with the applicable sections in Chapter 15 of the NFPA 99 and this code.

1601.2 System Design. Rainwater catchment systems shall be designed in accordance with this chapter by a certified plumbing contractor or registered design professional. Components, piping, and fittings used in a rainwater catchment system shall be listed.

1601.3 Permit. It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered a rainwater catchment system in a building or on a premise without first obtaining a permit to do such work from the Building Official.

1603.21 Rainwater Diversion Valves. Rainwater diversion valves ranging from 2 inches (50 mm) through 4 inches (100 mm) in diameter shall comply with IAPMO PS 59. Rainwater diversion valves ranging from 6 inches (150 mm) to 12 inches (300 mm) in diameter shall comply with IAPMO IGC 352. Where required, valves shall be accessible and shall include a filter located upstream of the valve.

Exam Questions:

70. Where must building storm sewers be located in order to comply with the material requirements, and what materials are permissible for their construction?

A. Building storm sewers located 2 feet or more away from any building or property line must be constructed of cast iron, vitrified clay, concrete, asbestos cement, ABS, PVC, CPE, or other pipes meeting applicable standards
B. Building storm sewers located at any distance from a building must be constructed solely from cast iron
C. Building storm sewers within 2 feet of any building must be made of PVC only
D. Building storm sewers must always be made of concrete, regardless of location

71. What code section are cleanouts required to be installed in accordance with?

A. Cleanouts should only be installed at elevations specified by local authorities
B. Cleanouts shall be optional and can be installed anywhere in the plumbing system
C. Cleanouts are not needed if the pipeline is less than 50 feet in length
D. Cleanouts shall be required and shall be installed as per Section 719.0 of this code

72. For what purpose are sanitary tee branch fittings and 90-degree medium turns permitted according to the code?

A. Sanitary tee branch fittings and 90-degree medium turns are only allowed for high-pressure gas lines
B. Sanitary tee branch fittings and 90-degree medium turns shall be permitted for interior and exterior storm drain piping
C. Sanitary tee branch fittings are restricted to potable water systems, while 90-degree turns are prohibited
D. Sanitary tee branch fittings and 90-degree medium turns must be avoided in all storm drain applications

73. What efficiency rating must filters meet according to DOE-STD-3020?

A. The filters should meet an efficiency standard of 80 percent HEPA with no specific size requirement
B. The filters need to be efficient to 0.5 µ and 95 percent HEPA
C. The filters must only be effective at capturing particles larger than 0.5 µ
D. The filters shall be efficient to 0.3 µ and 99.97 percent HEPA or better

74. How many conditions are listed for new or replacement valves to meet?

A. 8
B. 9
C. 7
D. 6

75. What requirement must rainwater diversion valves ranging from 2 inches through 4 inches in diameter meet?

A. They must be manually operated
B. They must be installed above ground
C. They must be made from stainless steel
D. They must comply with IAPMO PS 59

76. How many items are listed for shutoff valves to be identified with?

A. 3
B. 4
C. 8
D. 6

77. Which statement accurately describes the requirements for dental gas and vacuum systems?

A. These systems need only follow the general plumbing code and do not require specific compliance with NFPA 99
B. They should adhere only to the guidelines set forth by local health departments and are not subject to NFPA 99
C. They must comply with the applicable sections in Chapter 15 of the NFPA 99 and this Code
D. They must meet standards established exclusively by the American Dental Association, excluding any reference to NFPA 99

78. Who is qualified to design rainwater catchment systems according to Section 1601.2 System Design?

A. A certified plumbing contractor or registered design professional
B. An experienced homeowner with basic plumbing knowledge
C. A general contractor with no specific certification
D. Any individual with no formal training or certification

79. What is required before constructing, installing, or altering a rainwater catchment system?

A. Completing a safety training course
B. Informing the local water authority
C. Obtaining a permit from the Building Official
D. Submitting a checklist to the city council

80. How should common vent sizing be determined for it to meet the minimum requirements?

A. It should be double the sum of fixture units served
B. It should be the sum of fixture units served, but no smaller than the minimum vent size required for any fixture served or as determined from Table 703.2, whichever is larger
C. It should be exactly the size indicated in Table 703.2, regardless of fixture units served
D. It should be the average of the minimum vent sizes for all fixtures combined