Exterior Plumbing Quiz Part 1

Instructions: **$60**

1. Print these pages…..all reference materials are included.
2. Review and answer the simple questions in each **mini section**.
3. Circle the correct answers and transfer them to the answer sheets below.
4. Page down to the last page for the verification forms, answer sheets and mailing instructions.

This 6 hours course is approved for the following Credentials

1. Master Plumber
2. Journeymen Plumber
3. Master Plumber Restricted Service
4. Journeymen Plumber Restricted Service
5. POWTS Inspector
6. UDC Plumbing Inspector
7. Commercial Plumbing Inspector
8. Soil Tester
9. Utility Contractor

SPS 382.01 Scope. The provisions of this chapter apply uniformly to the design, construction, installation, supervision, maintenance and inspection of plumbing, including but not limited to sanitary and storm drainage, water supplies, wastewater treatment, and dispersal or discharge for buildings, except for POWTS systems as regulated by SPS 383.

1. The provisions of this chapter apply uniformly to the design , construction, installation, supervision, maintenance and inspection of plumbing, including POWTS systems.
   a. true
   b. false

SPS 382.015 Purpose. Pursuant to s. 145.02, Stats., the purpose of this chapter is to provide that all plumbing in connection with buildings and facilities in the state, including buildings owned by the state or any political subdivision thereof, shall be safe, sanitary and such as to safeguard the public health and the waters of the state.

2. The purpose of this chapter is to provide that all plumbing in connection with buildings and facilities in the state, including buildings _____ shall be safe.
   a. owned by the state
   b. owned by political subdivision
   c. owned by the federal government
   d. only a & b

SPS 382.03 Application. (1) The provisions of this chapter are not retroactive, unless specifically stated otherwise in the rule. **(2)** Pursuant to s. 145.13, Stats., this chapter is uniform in application and a municipality may not enact an ordinance for the design, construction, installation, supervision, maintenance and inspection of plumbing which is more stringent than this chapter, except as specifically permitted by rule. **(3)** A department interpretation of the requirements in this chapter shall supersede any differing interpretation by a lower level jurisdiction. A department decision on the application of the requirements in this chapter shall supersede any differing decision by a lower level jurisdiction.

3. This chapter is uniform in application and a municipality may enact an ordinance for the design, construction, installation, supervision, maintenance and inspection of plumbing which is more stringent than this chapter.

a. true
b. false

4. A department interpretation of the requirements in this chapter may supersede any differing interpretation by a lower level jurisdiction.

a. true
b. false

SPS 382.10 Basic plumbing principles. This chapter is founded upon basic principles of environmental sanitation and safety through properly designed, installed and maintained plumbing systems. Some of the details of plumbing construction may vary, but the basic sanitary and safety principles desirable and necessary to protect the health of people are the same. As interpretations may be required and as unforeseen situations arise which are not specifically addressed, the following intent statements and basic requirements shall be used to evaluate equivalency where applicable:

(1) INTENT. (a) Plumbing in connection with all buildings, public and private, intended for human occupancy, shall be installed and maintained in such a manner so as to protect the health, safety and welfare of the public or occupants and the waters of the state. (b) Plumbing fixtures, appliances and appurtenances, whether existing or to be installed, shall be supplied with water in sufficient volume and at pressures adequate to enable the fixtures, appliances and appurtenances to function properly and efficiently at all times and without undue noise under normal conditions of use. Plumbing systems shall be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning.

(c) Devices for heating and storing water in pressure vessels or tanks shall be so designed and installed as to prevent dangers of explosion or overheating.

(d) Drain systems shall be designed, constructed and maintained so as to conduct the wastewater or sewage efficiently and shall have adequate cleanouts.

(e) The drain systems shall be so designed as to provide an adequate circulation of air in all pipes and no danger of siphonage, aspiration or forcing of trap seals under conditions of ordinary use.

(f) A plumbing system shall be of durable material, free from defective workmanship, and designed and constructed so as to provide satisfactory service for its reasonable expected life.

(g) Proper protection shall be provided to prevent contamination of food, water, sterile goods and similar materials by backflow of wastewater.

(h) All plumbing fixtures shall be installed so as to provide adequate spacing and accessibility for the intended use and cleaning.

(2) BASIC REQUIREMENTS. (a) Every building intended for human occupancy shall be provided with an adequate, safe and potable water supply.

(b) To fulfill the basic needs of sanitation and personal hygiene, each dwelling connected to a POWTS or public sewer shall be provided with at least the following plumbing fixtures: one water closet, one wash basin, one kitchen sink and one bathtub or shower, except a system or device recognized under SPS 391 may be substituted for the water closet. All other structures for human occupancy shall be equipped with sanitary facilities in sufficient numbers as specified in SPS 360 to 366.

(c) Hot or tempered water shall be supplied to all plumbing fixtures that normally require hot or tempered water for proper use and function.

(d) Where plumbing fixtures exist in a building that is not connected to a public sewer system, suitable provision shall be made for treating, recycling, dispersing or holding the wastewater.

(e) Plumbing fixtures shall be made of durable, smooth, non−absorbent and corrosion resistant material, and shall be free from concealed fouling surfaces.

5. Plumbing in connection with all buildings, public and private, intended for human occupancy, shall be installed and maintained in such a manner so as to protect the _____.

a. health, safety and welfare of the public
b. occupants
c. waters of the state
d. all of the above

6. Plumbing fixtures, appliances and appurtenances, whether existing or to be installed, shall be supplied with _____to enable the fixtures, appliances and appurtenances to function properly and efficiently at all times and without undue noise under normal conditions of use.

a. water in sufficient volume
b. pressures adequate
c. both a & b
d. none of the above

7. Devices for heating and storing water in pressure vessels or tanks shall be so designed and installed as to prevent dangers of_____.

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

8. Drain systems shall be designed, constructed and maintained so as to conduct the wastewater or sewage efficiently and shall have adequate _____.

a. access to drainage
b. cleanouts
c. both a & b
d. none of the above

9. The drain systems shall be so designed as to provide an adequate circulation of air in all pipes and no danger of _____of trap seals under conditions of ordinary use.

a. siphonage
b. aspiration
c. forcing
d. all of the above

10. A plumbing system shall be of durable material, free from defective workmanship, and designed and constructed so as to provide satisfactory service for a _____ expected life.

a. limited
b. short term
c. reasonable
d. all of the above

11. Proper protection shall be provided to prevent contamination of food, water, sterile goods and similar materials by _____ of wastewater.

a. siphonage
b. backflow
c. aspiration
d. all of the above

12. All plumbing fixtures shall be installed so as to provide adequate spacing and accessibility for the _____.

a. intended use
b. cleaning
c. both a & b
d. neither a or b

13. Every building intended for human occupancy shall be provided with an _____ water supply.

a. adequate
b. safe
c. potable
d. all of the above

14. To fulfill the basic needs of sanitation and personal hygiene, each dwelling connected to a POWTS or public sewer shall be provided with at least the following plumbing fixtures: _____.

a. one water closet & wash basin
b. one kitchen sink
c. one bathtub or shower
d. all of the above

15. Hot or tempered water shall be supplied to all plumbing fixtures that normally require hot or tempered water for proper_____.

a. use
b. function
c. flow
d. both a & b

16. Where plumbing fixtures exist in a building that is not connected to a public sewer system, suitable provision shall be made for _____ the wastewater.

a. treating
b. recycling
c. dispersing or holding
d. all of the above

17. Plumbing fixtures shall be made of durable, smooth, non−absorbent and corrosion resistant material, and shall be free from _____ fouling surfaces.

a. external
b. concealed
c. both a & b
d. neither a or b

SPS 382.20 Plan review and cross connection control assembly registration. (1) GENERAL. Plans and specifications shall be submitted to the department or to an approved agent municipality for review in accordance with pars. (a) and (b).

Note: The department forms required in this chapter are available from the Safety and Buildings Division at P.O. Box 7162, Madison, WI 53707−7162, or at telephone (608) 266−3151 and (608) 264−8777

(a) *Department review.* Plumbing plans and specifications for the types of plumbing installations, except direct replacements, listed in Table 382.20−1 shall be submitted to the department for review, regardless of where the installation is to be located. A municipality shall be designated as an agent municipality in accordance with sub. (2). Written approval for the plumbing plans shall be obtained prior to installation of the plumbing.

(b) *Department or agent municipality review.* 1. Plumbing plans and specifications for the types of plumbing installations, except direct replacements, listed in Table 382.20−2 shall be submitted for review to an agent municipality, if the installation is to be located within the agent municipality or to the department, if the installation is not to be located within an agent municipality. A municipality shall be designated as an agent municipality in accordance with sub. (2). Written approval for the plumbing plans shall be obtained prior to installation of the plumbing. **Note:** For a listing of agent municipalities, see Appendix A−382.20 (2). **Note:** The number of plumbing fixtures to be submitted and reviewed by an agent
municipality is a subject of local ordinances.

2. Plan review and approval of one− and 2−family dwellings. Review and approval of plumbing plans for one− and 2−family dwellings shall be in accordance with the provisions specified in SPS 320.09.

(c) *Cross connection control assembly registration.* The installation of each reduced pressure principle backflow preventer, reduced pressure fire protection principle backflow preventer, spill resistant vacuum breaker, reduced pressure detector fire protection backflow prevention assembly or pressure vacuum breaker shall be registered with the department no later than 7 days after installation of the assembly.

18. Plumbing plans and specifications for the types of plumbing installations, _____, listed in Table 382.20−2 shall be submitted for review to an agent municipality, if the installation is to be located within the agent municipality or to the department, if the installation is not to be located within an agent municipality.

a. except professionally supervised installations
b. except direct replacements
c. both a or b
d. none of the above

19. Plans and specifications shall be submitted to the _____ for review in accordance with pars. (a) and (b).

a. department
b. an approved agent municipality
c. local plumbing inspector
d. both a or b

Table 382.20-1

Submittals To Department

Type of Plumbing Installation
1. All plumbing, new installations, additions and alterations, regardless of the number of plumbing fixtures involved, serving hospitals, nursing homes and ambulatory surgery centers.[a]
2. Plumbing, new installations, additions and alterations involving 16 or more plumbing fixtures, serving buildings owned by a metropolitan or sanitary sewer district.[b]
3. Plumbing, new installations, additions and alterations involving 16 or more plumbing fixtures, serving buildings owned by the state.[b]
4. Alternate and experimental plumbing systems.
5. Reduced pressure principle backflow preventers, reduced pressure fire protection principle backflow preventers, pressure vacuum breaker assemblies, reduced pressure detector fire protection backflow prevention assemblies, and spill resistant vacuum breakers serving health care and related facilities.
6. Stormwater and clearwater infiltration plumbing systems serving a public building or facility.[c]
7. Treatment systems, other than POWTS, designed to treat water for compliance with Table 82.70–1.[c]

[a] The registration of cross connection control devices as required under s. Comm 82.20 (1) (c) is included as a part of plan review and approval.

[b] For the purpose of plan review submittal, water heaters, floor drains, storm inlets, roof drains, multi–purpose piping (mpp) fire sprinklers and hose bibbs are to be included in the count.

c Agent municipalities may perform this review when so authorized by the department.

20. Plumbing submittal to the department is required for _____.
    a. alternate plumbing systems
    b. experimental plumbing systems
    c. both a & b
    d. neither a or b
21. Plumbing for building alterations involving ___ or more fixtures must be submitted to the department.
    a. 11
    b. 12
    c. 15
    d. 16

22. For the purpose of plan review submittal, _____ are to be included in the count.
    a. water heater
    b. hose bibbs
    c. rain gutters
    d. both a & b
23. All large municipalities are qualified to perform plumbing plan review.
    a. true
    b. false

Table 382.20-2
Submittals To Department Or Agent Municipality

Type of Plumbing Installation
1. New installations, additions and alterations to drain systems, vent systems, water service systems, and water distribution systems involving 16 or more plumbing fixtures to be installed in connection with public buildings.[a,b]
2. Grease interceptors to be installed for public buildings.
3. Garage catch basins, carwash interceptors and oil interceptors to be installed for public buildings and facilities.
4. Sanitary dump stations.
5. Piping designed to serve as private water mains.
6. Water supply systems and drain systems to be installed for manufactured home communities and campgrounds.[c]
7. Piping designed to serve as private interceptor main sewers greater than 4 inches in diameter when sized for gravity flow.
8. Chemical waste systems regardless of the number of plumbing fixtures.[c]
9. Stormwater systems, not including infiltration plumbing systems, serving a public building or facility where the drainage area is one acre or more.[d]
10. Mixed wastewater holding device.

[a] For the purposes of plan review submittal, water heaters, floor drains, storm inlets, roof drains, multi–purpose piping (MPP) fire sprinklers and hose bibbs are to be included in the count. For a phased project such as a mall or office complex fixture count includes all proposed fixtures connected to a common building sanitary sewer, a common water service and all storm sewers serving the building.

[b] For the purpose of plan submittal, public buildings do not include zero–lot–line row houses where each living unit is served by an individual water service and an individual building sewer.

[c] Only agent municipalities which are cities of the first class may review these types of installations.

[d] Plan review involving 16 or more plumbing fixtures also applies.

24. Submittal to the department or agent municipality is required for piping designed to serve as a private interceptor main sewer greater than ____" diameter when sized for gravity flow.

a. 3

b. 4
c. 6
d. all of the above

25. Only agent municipalities which are cities of the _____ class may review these types of installations.
a. first
b. second
c. third
d. all of the above

26. Submittal to the department or agent municipality is required for _____ in public buildings.
a. garage catch basin
b. oil interceptors
c. car wash interceptors
d. all of the above

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(2) AGENT MUNICIPALITIES. The department may designate to an approved municipality the authority to review and approve plumbing plans and specifications for those plumbing installations to be located within the municipality's boundary limits and which require approval under sub. (1) (b).
(a) An agent municipality shall employ at least 2 full time plumbing inspectors who have been qualified by the department.
1. The primary duties of the plumbing inspectors shall include plumbing plan review.
2. The plumbing inspectors shall be Wisconsin licensed master or journeyman plumbers.
Note: See Appendix for listing of agent municipalities.
(b) An agent municipality may waive its jurisdiction for plan review and approval for any project, in which case plans shall be submitted to the department for review and approval.
(c) Agent municipalities may set by ordinance the fees for plan review services.

27. An agent municipality shall employ at least ___ full time plumbing inspectors who have been qualified by the department.
a. 1
b. 2
c. 3
d. 0

28. An agent municipality shall employ full time plumbing inspectors who have been qualified by the department and _____.
a. The primary duties of the plumbing inspectors shall include plumbing plan review.
b. The plumbing inspectors shall be Wisconsin licensed master or journeyman plumbers.
c. both a & b
d. none of the above

29. An agent municipality shall waive its jurisdiction for plan review and approval for larger project, in which case plans shall be submitted to the department for review and approval.
a. true
b. false

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(3) PRIORITY PLAN REVIEW. An appointment may be made with the department to facilitate the examination of plans in less than the normal processing time. Complete plans along with the fee specified in SPS 302.09, shall be submitted to the department. The plans shall comply with all of the provisions of this section.
(4) PLANS AND SPECIFICATIONS. (a) At least 2 sets of plans and one copy of specifications which are clear, legible and permanent copies shall be submitted for examination and approval.

(b) All plans submitted for approval shall be accompanied by sufficient data and information for the department to determine if the installation and its performance will meet the requirements of SPS 381 to 384.
1. Information to accompany the plans shall include the location or address of the installation and the name of the owner.
2. Plans proposing the installation, creation or extension of a sanitary private interceptor main sewer which is to discharge to a municipal treatment facility shall:
a. Be accompanied by a letter from the appropriate designated planning or management agency indicating conformance with an approved area wide water quality management plan under ch. NR 121; and
b. Not be approved, if the municipality is ineligible for sanitary sewer extension approvals under s. NR 110.05. **Note:** For plans proposing the installation, creation or extension of a private interceptor main sewer which is to discharge to a municipal treatment facility, see also ch. NR 121.
3. Except as provided in subd. 4., plans proposing the installation of a building sewer for new construction which is to discharge to a municipal treatment facility shall:
a. Be accompanied by a letter from either the appropriate designated management agency or sanitary district indicating conformance with an approved areawide water quality management plan; and
b. Not be approved, if the municipality is ineligible for sanitary sewer extension approvals under s. NR 110.05.

30. PLANS AND SPECIFICATIONS. (a) At least ___ sets of plans and one copy of specifications which are clear, legible and permanent copies shall be submitted for examination and approval.
a. 1
b. 2
c. 3
d. any of the above

31. Information to accompany the plans shall include the _____.
a. location or address of the installation
b. name of the owner
c. both a & b
d. neither a or b

32. Plans proposing the installation, creation or extension of a sanitary private interceptor main sewer which is to discharge to a municipal treatment facility shall:
a. Be accompanied by a letter from the appropriate designated planning or management agency indicating conformance with an approved area wide water quality management plan under ch. NR 121
b. Not be approved, if the municipality is ineligible for sanitary sewer extension approvals under s. NR 110.05.
c. both a & b
d. neither a or b

33. Except as provided in subd. 4., plans proposing the installation of a building sewer for new construction which is to discharge to a municipal treatment facility shall:
a. Be accompanied by a letter from either the appropriate designated management agency or sanitary district indicating conformance with an approved areawide water quality management plan; and
b. Not be approved, if the municipality is ineligible for sanitary sewer extension approvals under s. NR 110.05
c. both a & b
d. neither a or b

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4. Plans proposing the installation of a building sewer for new construction which is to discharge to a municipal treatment facility shall not be required to comply with subd. 3., if:
a. The proposed installation is served by an existing building sewer which extends from the lot line to the public sewer and the proposed installation does not exceed the capacity of the existing building sewer or sewers; or
b. The plans indicate that a drainage load of not more than 54 drainage fixture units will be discharged through the building sewer. (c) Plumbing plans, index sheets and specifications for a plumbing system submitted for review and approval shall be signed in accordance with any of the following methods:
1. A Wisconsin registered architect, engineer or plumbing designer shall sign and seal or stamp all plans and accompanying specifications in accordance with ch. A−E 2.
2. A master plumber, master plumber−restricted service, master plumber−restricted appliance or a utility contractor shall sign and date all plumbing plans and accompanying specifications as provided under s. 145.06, Stats. Each sheet of plans and specifications submitted shall be signed and dated and shall include the valid Wisconsin license number of the individual responsible for the installation. Where more than one sheet is bound together into one volume, only the title sheet or index sheet shall be signed and dated by the individual responsible for the installation. The signed title or index sheet shall clearly identify all of the other sheets in the volume.

34. Plans proposing the installation of a building sewer for new construction which is to discharge to a municipal treatment facility shall not be required to comply with subd. 3., if:

a. The proposed installation is served by an existing building sewer which extends from the lot line to the public sewer and the proposed installation does not exceed the capacity of the existing building sewer or sewers; or
b. The plans indicate that a drainage load of not more than 54 drainage fixture units will be discharged through the building sewer. (c) Plumbing plans, index sheets and specifications for a plumbing system submitted for review and approval shall be signed in accordance with any of the following methods
c. both a & b
d. neither a or b

35. The plans indicate that a drainage load of not more than 54 drainage fixture units will be discharged through the building sewer. (c) Plumbing plans, index sheets and specifications for a plumbing system submitted for review and approval shall be signed in accordance with any of the following methods:A Wisconsin registered architect, engineer or plumbing designer shall _____all plans and accompanying specifications in accordance with ch. A−E 2.

a. sign
b. seal
c. stamp
d. all of the above

36. The plans indicate that a drainage load of not more than 54 drainage fixture units will be discharged through the building sewer. (c) Plumbing plans, index sheets and specifications for a plumbing system submitted for review and approval shall be signed in accordance with any of the following methods: A _____ shall sign and date all plumbing plans and accompanying specifications as provided under s. 145.06, Stats.

a. master plumber
b. master plumber−restricted service/appliance
c. utility contractor
d. all of the above

37. Where more than one sheet is bound together into one volume, all of the sheets shall be signed and dated by the individual responsible for the installation. The signed title or index sheet shall clearly identify all of the other sheets in the volume.

a. true
b. false

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3. A pump installer shall sign and date all plumbing plans and accompanying specifications for which the individual is responsible for the installation. Each sheet of plans and specifications submitted shall be signed and dated and shall include the valid Wisconsin license number of the individual responsible for the installation. Where more than one sheet is bound together into one volume, only the title sheet or index sheet shall be signed and dated by the individual responsible for the installation. The signed title or index sheet shall clearly identify all of the other sheets in the volume.
(d) 1. When requesting approval of an experimental plumbing system, all of the following shall be submitted:
a. At least 2 sets of plans signed in accordance with par. (d) and detailing the system installation for each site.
b. A letter of consent from the site or system owner of the installation. The letter shall acknowledge that the owner has received and read a copy of the experimental plumbing system submittal and is in agreement with all requirements listed within this subdivision.
c. Any additional information as requested by the department.
2. The registered architect, engineer, designer or master plumber responsible for the design of the experimental plumbing system shall, upon completion, certify in writing to the department that the installation is in compliance with the approved plans, specifications and data.
3. Onsite inspections shall be performed by the department at time intervals as specified by the department, but not less than once a year. Time intervals shall be included as conditions of approval. An inspection report shall be written. The department may assess a fee for each inspection.
Note: Refer to SPS 302 for applicable fees.
4. No later than five years after the date of the completed installation the department may perform one of the following:
a. Order the removal of the experimental plumbing system.
b. Issue an alternate approval as specified in sub. (12) (a).
c. Provide an extension of the experiment with conditions.
5. If an experimental plumbing system is subsequently codified in SPS 382 and 384, or ch. 145, Stats., the requirements as specified in subds. 3. and 4. do not apply.

38. No later than five years after the date of the completed installation the department may perform one of the following:
a. Order the removal of the experimental plumbing system.
b. Issue an alternate approval as specified in sub. (12) (a).
c. Provide an extension of the experiment with conditions.
d. all of the above
39. If an experimental plumbing system is subsequently codified in SPS 382 and 384, or ch. 145, Stats., the requirements as specified in subds. 3. and 4. apply.
a. true
b. false

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(5) PLAN REVIEW. Except as provided in sub. (12), and pursuant to SPS 32.07 (3), the department shall review and make a determination on an application for plan review within 15 business days.
(a) *Conditional approval.* If, upon review, the department determines that the plans substantially conform to the provisions of SPS 382 to 384, a conditional approval, in writing, shall be granted. All noncode complying conditions stated in the conditional approval shall be corrected before or during installation.

(b) *Denial of approval.* If, upon review, the department determines that the plans do not substantially conform to the provisions of SPS 382 to 384, the request of conditional approval shall be denied in writing.
(6) EVIDENCE OF APPROVAL. The plumber responsible for the installation of the plumbing shall keep at the construction site at least one set of plans bearing the department's or the agent municipality's stamp of approval and at least one copy of specifications. The plans and specifications shall be open to inspection by an authorized representative of the department.
(7) FEES. Fees for plumbing plan review and petition for variance shall be submitted in accordance with SPS 302.64 and 302.52.

40. The department shall review and make a determination on an application for plan review within ___ business days.
a. 7
b. 10
c. 14
d. 15
41. All noncode complying conditions stated in the conditional approval shall be corrected _____ installation.
a. before
b. during
c. both a or b
d. none of the above
42. If, upon review, the department determines that the plans do not substantially conform to the provisions of SPS 382 to 384, the request of conditional approval shall be denied _____.
a. by phone
b. by messenger
c. in writing
d. all of the above
43. The _____ responsible for the installation of the plumbing shall keep at the construction site at least one set of plans bearing the department's or the agent municipality's stamp of approval and at least one copy of specifications.
a. contractor
b. owner
c. plumber
d. all of the above
44. The plans and specifications shall be open to inspection by an authorized representative of the_____.
a. department
b. municipality public works
c. county workers
d. any neighboring parcel owners

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(8) REVISIONS. All changes or modifications, which involve the provisions of SPS 382 to 384, made to plumbing plans and specifications, which have been granted approval under sub. (1), shall be submitted to the department or agent municipality for examination. All changes and modifications shall be approved in writing by the department or agent municipality prior to installation of the plumbing.
(9) REVOCATION OF APPROVAL. The department may revoke any approval, issued under the provisions of this chapter, for any false statements or misrepresentation of facts on which the approval was based.
(10) DEPARTMENT LIMITATION AND EXPIRATION OF APPROVAL.

(a) A conditional approval of a plan by the department shall not be construed as an assumption by the department of any responsibility for the design; and the department does not hold itself liable for any defects in construction, nor for any damages that may result from the specific installation. (b) Plan approval by the department or its authorized representative shall expire 2 years after the date indicated on the approval letter, if construction has not commenced within that 2 year period.

45. All changes and modifications shall be approved in writing by the _____ prior to installation of the plumbing.

a. department
b. agent municipality
c. public works department
d. both a or b

46. The department may revoke any approval, issued under the provisions of this chapter, for any _____ of facts on which the approval was based.

a. false statements
b. misrepresentation
c. non payments
d. both a or b

47. Plan approval by the department or its authorized representative shall expire ___ years after the date indicated on the approval letter, if construction has not commenced within that time period.

a. 1
b. 2
c. 3
d. 4

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(11) PETITION FOR VARIANCE. (a) *Procedure.* The department shall consider and may grant a variance to a provision of this chapter in accordance with SPS 303.

Note: Chapter SPS 303 requires the submittal of a petition for variance form (SBD−9890) and a fee, and that an equivalency is established in the petition for variance that meets the intent of the rule being petitioned. Chapter SPS 303 also requires the department to process regular petitions within 30 business days and priority petitions within 10 business days.

Note: Form SBD−9890−X is available on request at no charge from the department at the Safety and Buildings Division, P.O. Box 2509, Madison WI 53701−2509, telephone (608) 266−1818.

(b) *Petition processing time.* Except for priority petitions, the department shall review and make a determination on a petition for variance within 30 business days of receipt of all calculations, documents and fees required to complete the review. The department shall process priority petitions within 10 business days.

Note: The petition for variance form (SBD−8) is available from the Safety and Buildings Division, P. O. Box 7162, Madison, WI 53707.

48. Chapter SPS __ requires the submittal of a petition for variance form (SBD−9890) and a fee, and that an equivalency is established in the petition for variance that meets the intent of the rule being petitioned.

a. 381
b. 382
c. 303
d. 305

49. The department to process regular petitions within ___ business days.

a. 7
b. 10
c. 14

d. 30

50. The department to process priority petitions within ____ business days.

a. 7
b. 10
c. 14
d. 30

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(12) ALTERNATE AND EXPERIMENTAL PLUMBING SYSTEM REVIEW AND APPROVAL. The provisions of SPS 384 or ch. 145, Stats., are not intended to prevent the design and use of approved innovative plumbing systems.

(a) *Alternate plumbing systems.* The department may issue an approval of an alternate plumbing system if the system complies with the intent of SPS 382 and 384, or ch. 145, Stats.

1. For an alternate plumbing system, before availability for statewide installation and use, an alternate plumbing system approval shall be issued. Concepts, plans, specifications and the documentation to support the system design shall be submitted to the department for review.

2. The department may require the submission of any information deemed necessary for review. Sufficient evidence shall be submitted to substantiate at least the following:

a. Assertions of function and performance.

b. Compliance with the intent of SPS 382 and 384, or ch. 145, Stats.

3. Pursuant to SPS 302.07 (3), the department shall review and make a determination on an application for an alternate plumbing system within 3 months. Approval for an alternate plumbing system shall be issued by the department in writing.

4. The department may include specific conditions in issuing an approval for an alternate plumbing system, including an expiration date for the approval. A violation of any of the conditions under which an approval is issued shall constitute a violation of this chapter.

5. If upon review the department determines that an alternate plumbing system does not comply with the intent of SPS 382 and 384, or ch. 145, Stats., the request for approval shall be denied in writing.

(b) *Experimental plumbing systems.* The department may issue an approval of an experimental plumbing system for the purpose of proving compliance with the intent of SPS 382 and 384 and ch.145, Stats.

1. For an experimental plumbing system, a separate approval shall be obtained for each system or project to be installed for the purpose of proving compliance with the intent of SPS 382 and 384 and ch. 145, Stats. Approval for an experimental plumbing system shall be issued by the department in writing.

2. The department may require the submission of additional information deemed necessary for determining that the design meets the intent of SPS 382 and 384 and ch. 145, Stats.

3. Pursuant to SPS 302.07 (3), the department shall review and make a determination on an application for an experimental plumbing system within 6 months.

4. The department may include specific conditions in issuing an approval for an experimental plumbing system, including an expiration date for the approval. A violation of any of the conditions under which an approval is issued shall constitute a violation of this chapter.

5. Denial of an experimental plumbing system or project by the department shall be made in writing.

6. The department may establish parameters to limit the number of applications for review it will accept for experimental plumbing systems.

(c) *Modification.* If an approved alternate or experimental plumbing system is modified or additional assertions of function or performance are made, the approval shall be void, unless the system is resubmitted to the department for review and approval is granted.

(d) *Revocation of approval.* The department may revoke an approval issued under this section for any false statements or misrepresentations of facts or data on which the approval was based, or as a result of system failure.

(e) *Limitations.* An approval issued by the department for an alternate or experimental plumbing system may not be construed as an assumption of any responsibility for defects in design, construction or performance of any system nor for any damages that may result.
(f) *Fees.* Fees for the review of an alternate or experimental plumbing system under this section and any onsite inspections shall be submitted in accordance with SPS 302.

51. The provisions of this chapter, SPS 384 or ch. 145, Stats., are intended to prevent the design and use of approved innovative plumbing systems.
a. true
b. false
52. The department may issue an approval of an alternate plumbing system if the system complies with the intent of chs. _____.
a. 382
b. 384
c.145, Stats.
d. all of the above
53. For an alternate plumbing system, before availability for statewide installation and use, an alternate plumbing system approval may be issued.
a. true
b. false
54. Concepts, plans, specifications and the documentation to support the system design shall be submitted to the _____ for review.
a. department
b. agent municipality
c. public works department
d. both a or b
55. For an experimental plumbing system, a separate approval shall be obtained for several systems or project to be installed for the purpose of proving compliance with the intent of SPS 382 and 384 and ch. 145, Stats.
a. true
b. false
56. . If an approved alternate or experimental plumbing system is modified or additional assertions of function or performance are made, the approval shall be void regardless.
a. true
b. false
57. An approval issued by the department for an alternate or experimental plumbing system may not be construed as an assumption of any responsibility for defects in _____ of any system nor for any damages that may result.
a. design
b. construction
c. performance
d. all of the above

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(13) CROSS CONNECTION CONTROL REGISTRATION. (a) Registration, as specified in sub. (1) (c), shall be submitted in a format acceptable to the department.
Note: The forms required in this chapter are available from the Safety and Buildings Division, P.O. Box 7162, Madison, WI 53707−7162, or at telephone (608) 266−3151 and (608) 264−8777 (TTY).
(b) The form for registering cross connection control devices and assemblies with the department shall include at least all of the following information:
1. The building or facility name and address where the device or assembly is or will be installed.

2. The location of the cross connection control device or assembly within the building or facility.
3. A description of the cross connection control device or assembly including the size, model number, serial number and manufacturer.
4. The name of the owner or owner's agent submitting the registration form and contact information.
(c) Each registration form submitted shall be accompanied by the appropriate fee in accordance with s. SPS 302.645.
(d) Upon receipt of a completed registration form, the department shall issue written confirmation of registration including a department assigned identification number for each cross connection control device or assembly.
(e) Upon permanent removal or replacement of any reduced pressure principle backflow preventer, reduced pressure fire protection principle backflow preventer, spill resistant vacuum breaker, reduced pressure detector fire protection backflow prevention assembly, or pressure vacuum breaker, the owner shall notify the department in writing using a format acceptable to the department.
(14) PENALTIES. Penalties for violations of this chapter shall be assessed in accordance with s. 145.12, Stats.

58. The form for registering cross connection control devices and assemblies with the department shall include the following information:
a. The building or facility name and address where the device or assembly is or will be installed.
b. The location of the cross connection control device or assembly within the building or facility.
c. A description of the cross connection control device or assembly including the size, model number, serial number and manufacturer.
d. all of the above
59. Upon receipt of a completed registration form, the department shall issue written confirmation of registration including a department assigned identification number for each cross connection Control _____.
a. device
b. assembly
c. valve
d. both a or b
60. Upon permanent removal or replacement of any reduced pressure principle backflow preventer, reduced pressure fire protection principle backflow preventer, spill resistant vacuum breaker, reduced pressure detector fire protection backflow prevention assembly, or pressure vacuum breaker, the owner shall notify the _____ in writing using a format acceptable to the department.
a. local inspector
b. certified cross connection tester
c. general contractor
d. department

SPS 382.21 Testing and inspection. (1) TESTING OF PLUMBING SYSTEMS. Except as provided in par. (a), all new plumbing and all parts of existing systems which have been altered, extended or repaired shall be tested as specified in sub. (2) to disclose leaks and defects before the plumbing is put into operation. (a) *Waiver of testing.* 1. The testing of the plumbing shall not be required where the installation does not include the addition, replacement, alteration or relocation of any water distribution, drain or vent piping.
2. a. Field testing the installation of a storm building sewer and a storm private interceptor main sewer is not required.
b. The joints and connections to be employed for storm building sewer piping shall conform with s. SPS 384.40 (1) (a).

(b) *Local inspection.* Where the plumbing is installed in a municipality having a local inspector, the testing of the plumbing shall be done in the presence of a plumbing inspector, except as provided in subd. 1. b.
1. 'Notice of inspection.' a. The plumber responsible for the installation shall notify the plumbing inspector in person, by telephone or in writing when the work is ready for inspection. b. Except as permitted in par. (c), if the inspection is not made by the end of the normal business day following the day of notification, not including Saturday, Sunday or legal holidays, the plumber may proceed with the testing and the installation. The master plumber responsible for the installation obtains the inspector's permission to provide a written test report in a format acceptable to the inspector. **Note:** See the appendix for a sample affidavit form.
2. 'Preparations for inspection.' When the installation is ready for inspection, the plumber shall make such arrangements as will enable the plumbing inspector to inspect all parts of the plumbing system. The plumber shall have present the proper apparatus and appliances for making the tests, and shall furnish such assistance as may be necessary in making the inspection.
3. 'Rough−in inspection.' A rough−in inspection shall be made when the plumbing system is roughed−in and before fixtures are set. Except as provided in subd. 1., plumbing work shall not be closed in, concealed, or covered until it has been inspected and approved by the plumbing inspector and permission is granted to do so.
4. 'Final inspection.' a. Upon completion of the plumbing installation and before final approval is given, the plumbing inspector shall inspect the work.
b. Municipalities may require that a final test be conducted in accordance with sub. (2) (h) and that the final test, when required by the municipality, shall be observed by the plumbing inspector.
5. 'Reinspections.' Whenever the plumbing official finds that the work or installation does not pass any initial test or inspection, the necessary corrections shall be made to comply with this chapter. The work or installation shall then be resubmitted for inspection to the plumbing inspector.
(c) *Inspection of one−and 2−family dwellings.* The inspection of plumbing installations for one−and 2−family dwellings shall be in accordance with SPS 320.08 to 230.11.
(d) The initial testing of cross connection control assemblies shall comply with SPS 382.22 (8).

61. All new plumbing and all parts of existing systems which have been _____ shall be tested.
    a. altered
    b. extended
    c. repaired
    d. all of the above
62. Field testing the installation of a _____ is not required.
    a. storm building sewer
    b. storm private interceptor main sewer
    c. building sewer
    d. both a & b
63. The joints and connections to be employed for storm building sewer piping do not need conform with SPS 384.40 (1) (a).
    a. true
    b. false
64. Where the plumbing is installed in a municipality having a local inspector, the testing of the plumbing shall be done in the presence of a sanitary district's appointed person.
    a. true
    b. false
65. The plumber responsible for the installation shall notify the plumbing inspector in person, by telephone or in writing when the work is ready for inspection. b. Except as permitted in par. (c), if the

inspection is not made by the end of the normal business day following the day of notification, including Saturday, Sunday or legal holidays, the plumber may proceed with the testing and the installation.

a. true
b. false

66. When the installation is ready for inspection, the plumber shall make such arrangements as will enable the plumbing inspector to inspect all parts of the plumbing system. The _____ shall have present the proper apparatus and appliances for making the tests, and shall furnish such assistance as may be necessary in making the inspection.

a. plumber
b. inspector
c. contractor
d. any of the above

67. Municipalities may require that a final test be conducted in accordance with sub. (2) (h) and that the final test, when required by the municipality, shall be observed by the _____.

a. plumbing contractor
b. general contractor
c. plumbing inspector
d. any of the above

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(2) TESTING PROVISIONS. (a) *General.* The testing of plumbing installations shall be conducted in accordance with this paragraph.

1. 'Equipment, material and labor for tests.' All equipment, material and labor required for testing a plumbing system or part thereof shall be furnished by the plumber responsible for the installation.

2. 'Exposure of work.' Except as provided in pars. (b) and (e), all new, altered, extended or replaced plumbing shall be left uncovered and unconcealed until it has been tested. Where the work has been covered or concealed before it is tested, it shall be exposed for testing.

(b) *Sanitary building sewer and sanitary private interceptor main sewer.* A sanitary building sewer and a sanitary private interceptor main sewer shall be tested for leaks and defects with water or air before or after being covered in accordance with either subd.

1. or 2. The test for leaks and defects may be applied to the entire building sewer or private interceptor main sewer or in sections. For the purposes of this subdivision, the testing of a building sewer or private interceptor main sewer is not required to include the manholes serving the sewer.

1. The building sewer or private interceptor main sewer shall be tested by insertion of a test plug at the point of connection with the public sewer. The sewer shall then be filled with water under a head of not less than 10 feet. The water level at the top of the test head of water shall not drop for at least 15 minutes.

2. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening, and, after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 3 pounds per square inch. This pressure shall be held without introduction of additional air for a period of at least 15 minutes.

(c) *Building drain.* The entire building drain with all its branches, receptacles and connections shall be brought so far as practical to the surface or grade of the basement floor and shall be tested with water or air in accordance with par. (g).

(d) *Drain and vent systems.* The piping of a drain and vent systems, including conductors, shall be tested upon completion of the rough piping installation with water or air in accordance with par.(g).

(e) *Private water mains and water services.* Private water mains and water services shall be inspected before being covered. The private water mains and water services shall be tested and proven water tight under water pressure not less than the working pressure under which it is to be used. The water used for testing shall be obtained from a potable source of supply.

Note: Standard NFPA 24 for combination water services and combination private water mains may include more stringent requirements for testing.

(f) *Water distribution system.* The piping of a water distribution system shall be tested and proved water tight under a water pressure not less than the working pressure under which it is to be used. The water used for tests shall be obtained from a potable source of supply.

68. All _____ plumbing shall be left uncovered and unconcealed until it has been tested.
    a. new
    b. altered
    c. extended
    d. all of the above
69. All equipment, material and labor required for testing a plumbing system or part thereof shall be furnished by the _____ responsible for the installation.
    a. plumber
    b. inspector
    c. contractor
    d. any of the above
70. Where the work has been covered or concealed before it is tested, it may be exposed for testing.
    a. true
    b. false
71. A sanitary building sewer and a sanitary private interceptor main sewer shall be tested for leaks and defects with water or air _____ being covered.
    a. before
    b. after
    c. both a or b
    d. neither a or b
72. Testing of a building sewer or private interceptor main sewer is not required to include the _____ serving the sewer.
    a. cleanouts
    b. manholes
    c. both a or b
    d. neither a or b
73. The test for leaks and defects shall be applied to the entire building sewer or private interceptor main sewer.
    a. true
    b. false
74. The building sewer or private interceptor main sewer shall be tested by insertion of a test plug at the point of connection with the public sewer. The sewer shall then be filled with water under a head of not less than ___ feet.
    a. 3
    b. 10
    c. 15
    d. all of the above
75. The building sewer or private interceptor main sewer shall be tested by insertion of a test plug at the point of connection with the public sewer. The water level at the top of the test head of water shall not drop for at least ____ minutes.
    a. 3
    b. 10
    c. 15
    d. all of the above

76. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening, and, after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of ____ pounds per square inch.

a. 3
b. 10
c. 15
d. all of the above

77. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening, this pressure shall be held without introduction of additional air for a period of at least _____ minutes.

a. 3
b. 10
c. 15
d. all of the above

78. The entire building drain with all its branches, receptacles and connections shall be brought so far as practical to the surface or grade of the basement floor and shall be tested with_____.

a. water
b. air
c. both a or b
d. neither a or b

79. Private water mains and water services shall be inspected before or after being covered.

a. true
b. false

80. The private water mains and water services shall be tested and proven water tight under water pressure _____ than the working pressure under which it is to be used.

a. less
b. more
c. not less
d. all of the above

81. The private water mains and water services shall be tested and proven water tight and the water used for testing shall be obtained from a _____ source of supply.

a. non potable
b. potable
c. any water source
d. all of the above

SPS 382.30 Sanitary drain systems. (1) SCOPE. The provisions of this section set forth the requirements for the design and installation of sanitary drain systems, including building drains and building sewers. **Note:** The provisions for storm and clear water drain systems are specified in SPS 382.36.

(2) MATERIALS. All sanitary drain systems shall be constructed of approved materials in accordance with SPS 384.

(3) LOAD ON DRAIN PIPING. (a) *Intermittent flow.* 1. 'Fixture.'

The load factor on drain piping shall be computed in terms of drainage fixture unit values specified in Table 382.30–1 for the corresponding listed fixture.

2. 'Devices.' Drainage fixture unit values for intermittent flow devices not listed in Table 382.30–1 shall be computed on the basis of one fixture unit equaling one gallon per minute of flow.

Note: Equipment with a timed discharge cycle(s) of 2 minutes or less may be considered as an intermittent flow device.

(b) *Continuous flow devices.* Drainage fixtures unit values for continuous flow devices such as pumps, ejectors, air conditioning equipment or similar devices that discharge continuously shall be computed on the basis of 2 fixture units for each one gallon per minute of flow.

82. All sanitary drain systems shall be constructed of approved materials in accordance with SPS ____.
a. 381
b. 382
c. 383
d. 384

83. The load factor on drain piping shall be computed in terms of drainage fixture unit values specified in Table 382.30–1 for the _____ listed fixture.
a. similar
b. corresponding
c. basic
d. all of the above

84. 'Devices.' Drainage fixture unit values for intermittent flow devices not listed in Table 382.30–1 shall be computed on the basis of one fixture unit equaling one _____ per minute of flow.
a. quart
b. liter
c. gallon
d. all of the above

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(4) SIZE OF DRAIN PIPING. (a) *Maximum loading.* 1. The total drainage load in any portion of drain piping shall not exceed the limits specified in Tables 382.30−2 and 382.30−3. 2. The drainage fixture unit values assigned to a receptor which is to receive only the indirect waste discharge from a relief valve on a domestic water heater may be disregarded when determining the minimum size of the building drain and building sewer. Any drain piping between the receptor and the building drain shall be sized by including the assigned fixture unit values for the type of receptor. **Note:** See SPS 382.31 (17) for sizing requirements of combination drain and vent systems. **Note:** See Appendix for further explanatory material.
(b) *Minimum size of building sewers.* 1. 'Gravity flow sewers.' The minimum size of a gravity flow sanitary building sewer shall be 4" in diameter. A municipality or sanitary district by ordinance may require that portion of the building sewer between the lot line and the public sewer to be larger than 4" in diameter.
2. 'Pressurized sewers.' a. Sewers pressurized through the use of sewage ejectors, sewage pumps or sewage grinder pumps shall be sized to maintain a minimum flow velocity of 2 feet per second and shall be in accordance with the ejector or pump manufacturer's recommendations.
b. Pressurized building sewers shall be sized not less than 2" in diameter for sewage ejectors and sewage pumps, and 1 ¼" in diameter for all sewage grinder pumps.
(c) *Minimum size of private interceptor main sewers.* 1. Except as provided in subd. 3., the minimum size of a gravity flow private interceptor main sewer shall be 4" in diameter.
2. Except as provided in subd. 3., the minimum size of pressurized private interceptor main sewer shall be such so as to maintain a minimum flow velocity of 2 feet per second.
3. A municipality or a sanitary district may by ordinance, require the minimum size of a private interceptor main sewer to be larger than 4" in diameter.
4. Private interceptor main sewers 6" or less in diameter may not exceed the drainage fixture limits in Table 382.30−3.
5. Private interceptor main sewers 8" or larger in diameter shall conform with the design criteria specified in s. NR 110.13

(d) *Future fixtures.* Where provisions are made for the future installation of fixtures, the drainage fixture unit values of such fixtures shall be considered in determining the required sizes of drain and vent pipes. Construction to provide for future installations shall be terminated with a plugged fitting or fittings.

85. The drainage fixture unit values assigned to a receptor which is to receive only the indirect waste discharge from a relief valve on a domestic _____ may be disregarded when determining the minimum size of the building drain and building sewer.
a. wash machine
b. floor drain
c. water heater
d. furnace

86. The total drainage load in any portion of drain piping shall not exceed the limits specified in Table _____.
a. 382.30−2
b. 382.30−3
c. 382.30−4
d. both a & b

87. The minimum size of a gravity flow sanitary building sewer shall be ___" in diameter.
a. 2
b. 3
c. 4
d. 6

88. A municipality or sanitary district by ordinance may require that portion of the building sewer between the lot line and the public sewer to be larger than ___" in diameter.
a. 2
b. 3
c. 4
d. 6

89. Sewers pressurized through the use of sewage ejectors, sewage pumps or sewage grinder pumps shall be sized to maintain a minimum flow velocity of ____ feet per second
a. 2
b. 3
c. 4
d. 6

90. Pressurized building sewers shall be sized not less than ___" in diameter for sewage ejectors and sewage pumps.
a. 2
b. 3
c. 4
d. 6

91. Pressurized building sewers shall be sized not less than ___" in diameter for all sewage grinder pumps.
a. 2
b. 3
c. 4
d. none of the above

92. A municipality or a sanitary district may by ordinance, require the minimum size of a private interceptor main sewer to be larger than ____" in diameter.
a. 2
b. 3

c. 4

d. none of the above

93. Private interceptor main sewers 6” or less in diameter may not exceed the drainage fixture limits in Table_____.

a. 382.30−2

b. 382.30−3

c. 382.30−4

d. NR 110.13

94. Private interceptor main sewers 8” or larger in diameter shall conform with the design criteria specified in _____.

a. 382.30−2

b. 382.30−3

c. 382.30−4

d. NR 110.13

95. Where provisions are made for the future installation of fixtures, the drainage fixture unit values of such fixtures may be considered in determining the required sizes of drain and vent pipes. Construction to provide for future installations may be terminated with a plugged fitting or fittings.

a. true

b. false

(d) *Future fixtures.* Where provisions are made for the future installation of fixtures, the drainage fixture unit values of such fixtures shall be considered in determining the required sizes of drain and vent pipes. Construction to provide for future installations shall be terminated with a plugged fitting or fittings.

Table 382.30-1

Drainage Fixture Unit Values By Fixture Type

Type of Fixture	Drainage Fixture Unit Value (dfu)	Trap Size Minimum Diameter (inches)
Automatic Clothes Washers:		
Commercial, individual	4	2
Commercial, large capacity	a	a
Self Service Laundry	4	2
Residential	4	2
Autopsy Table	h	h
Bathroom Group, includes: water closet, lavatory, bathtub or shower	6	
Bathtubs, all types[b]	2	1 1/2
Bedpan Washer	6	2
Beer Tap	1/2	1 1/4
Bidet	2	1 1/2
Bottle Cooler	1/2	1 1/4
Campsite Receptor	6	4
Coffee Maker	1/2	1 1/4
Cuspidor, fountain or dental	1	1 1/4
Dipper Well	1	1 1/4
Dishwasher, commercial type	c	c
Dishwasher, residential type	2	1 1/2
Drinking Fountain	1/2	1 1/4
Exhaust Hood Washer	4	2
Floor Drain:		
2 inch	2	2
3 inch	3	3
4 inch	4	4
Larger than 4 inch	4	d
Glass Filler	1/2	1 1/4
Glass Washer	2	1 1/2
Health Care Fixtures:		
Clinic sink	6	NA
Exam/treatment sink	1	1 1/4
Sitz bath	2	1 1/2
Ice Chest	1/2	1 1/2
Laundry Tray, 1 or 2 compartment	2	1 1/2
Lavatory	1	1 1/4
Lavatory, combination per trap	1	1½
Manufactured Home	11	NA
Refrigerated Food Display Case	1	1
Shower Stall:		
Residential	2	2
Public, individual	2	2
Public, group	2 per shower head	2
Sinks:[i]		
Bar, residential	1	1¼
Breakroom (single compartment)	1	1 1/2
Cup	1/2	1 1/4
Factory, wash, per set of faucets	1	1 1/2
Fountain wash up	1	1 1/2
Fountain or Bar, 4 compartments or less	3	1 1/2
Food Waste Grinder, commercial 2 HP or less	2	f
Food Waste Grinder, commercial 3 HP or more	3	f
Laboratory	2	1 1/2
Laboratory, school	2	1 1/2
Classroom	1	1 1/4
Pack or plaster	3	2
Residential, with or without food waste grinder	2	1 1/2
Restaurant, Scullery, pots and pans — 4 compartments or less	3	f
Food, rinsing, cleaning or thawing	3	2
Service Sink, Flushing Rim	6	3
Service Sink, 2 inch diameter, wall outlet	2	2
Service Sink, 3 inch diameter, wall outlet	3	3
Service Sink, 2 inch diameter, floor outlet	2	2
Service Sink, 3 inch diameter, floor outlet	3	3
Shampoo Sink, barber or beauty parlor	2	1 1/2
Surgeons, wash up	3	1 1/2
Wash Fountain, circular and semi−circular	2	1 1/2
Receptors of Indirect Wastes, gravity flow discharge:		
1 1/4 inch receptor outlet diameter	1	1 1/4
1 1/2 inch receptor outlet diameter	2	1 1/2
2 inch receptor outlet diameter	3	2
3 inch receptor outlet diameter	4	3
4 inch receptor outlet diameter	6	4
Larger than 4 inch receptor outlet diameter	8	f
Soda Dispenser	1/2	1 1/4
Sterilizers:		
Bedpan	4	2
Garbage can washer	3	3
Instrument or water	1	
Urinal	2	g
Water Closet, nonpublic	4	g
Water Closet, public	6	g

NA = not applicable

[a] Based on discharge rate of the fixture.

[b] Includes foot, sitz and infant baths and regular bathtubs with or without showers or whirlpool circulation piping.

[c] Based on discharge rates and number of outlets; a 4" diameter trap and drain pipe minimum recommended.

[d] Trap size corresponds to the size of the floor drain.

[f] Trap size corresponds to the size of the drain outlet.

[g] Trap size specified in referenced standards of s. Comm 84.20.

[h] Trap size corresponds to the size of the drain outlet. Use the dfu value of the receptor serving the autopsy table.

[i] Sinks not specified in this table shall be assigned 1 dfu for 1 1/4" tailpiece, 2 dfu for 1 1/2" tailpiece and 3 dfu for 2" tailpiece.

96. The total drainage fixture units for 6 bathroom groups including a water closet, bathtub, and a lavatory would be _____ dfu's.

a. 24
b. 30
c. 36
d. none of the above

97. The total drainage fixture units for 6 camp site receptors would be _____ dfu's.
a. 24
b. 30
c. 36
d. none of the above

98. The total drainage fixture units for 6 healthcare clinic sinks would be _____ dfu's.
a. 24
b. 30
c. 36
d. none of the above

99. The total drainage fixture units for 6 public water closets would be _____ dfu's.
a. 24
b. 30
c. 36
d. none of the above

100. The total drainage fixture units for 6 flush rim service sinks would be _____ dfu's.
a. 24
b. 30
c. 36
d. none of the above

Table 382.30-3

Building Drains, Building Subdrains, Building Sewers and Private Interceptor Main Sewers[a]

Pipe Diameter (inches)	Maximum Number of Drainage Fixture Units Which May Drain Through Any Portion of a Building Drain, Building Subdrain, Building Sewer or Private Interceptor Main Sewer			
	Pitch (inch per foot)			
	1/16	1/8	1/4	1/2
1 ¼	NP[b]	NP	1	1
1 ½	NP	NP	3	3
2	NP	NP	6	9
3	NP	36	42	50
4	NP	180	216	250
5	NP	390	480	575
6	NP	700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	3,900	4,600	5,600	6,700
15	7,000	8,300	10,000	12,000

[a] Private interceptor main sewers 6 inches or less in diameter, see s. NR 110.13 for private interceptor main sewers 8 inches or larger in diameter.
[b] NP means Not Permitted.

101. The maximum number of drainage fixture units which may drain through a 6" diameter pipe with a ½" of pitch per foot would be?
a. 250
b. 575
c. 1000

d. 2300

102. The maximum number of drainage fixture units which may drain through an 8” diameter pipe with a ½” of pitch per foot would be?

a. 250
b. 575
c. 1000
d. 2300

103. The maximum number of drainage fixture units which may drain through a 4” diameter pipe with a 1/16” of pitch per foot would be?

a. 250
b. 216
c. 180
d. NP

---

(5) PITCH OF HORIZONTAL DRAIN PIPING. All horizontal drain piping 4” or larger in diameter shall be installed at a pitch which produces a computed velocity of at least 2 feet per second when flowing half full.

(a) *Horizontal branch drains.* 1. The minimum pitch of horizontal branch drains 2” or less in diameter shall be ¼ “per foot. 2. The minimum pitch of horizontal branch drains larger than 2” in diameter shall be 1/8” per foot.

(b) *Building drains and building sewers.* 1. The minimum pitch of building drains shall be in accordance with Table 382.30−3.

2. a. The minimum pitch of building sewers 10” or less in diameter shall be in accordance with Table 382.30−3.

b. The minimum pitch of building sewers 12” or larger in diameter shall conform with the minimum pitch specified for municipal sewers in s. NR 110.13.

Note: See also SPS 382.30 (4) (c) 5. for further explanatory material.

(c) *Private interceptor main sewers.* 1. The minimum pitch of private interceptor main sewers 6” or less in diameter shall be in accordance with Table 382.30−3.

2. The minimum pitch of private interceptor main sewers 8” or larger in diameter shall conform with the minimum pitch specified for municipal sewers in s. NR 110.13.

Note: See Appendix for further explanatory material.

104. The minimum pitch of horizontal branch drains 2” or less in diameter shall be ___ “per foot.

a. 1/16
b. 1/8
c. ¼
d. 1/2

105. The minimum pitch of horizontal branch drains larger than 2” in diameter shall be ___” per foot.

a. 1/16
b. 1/8
c. ¼
d. 1/2

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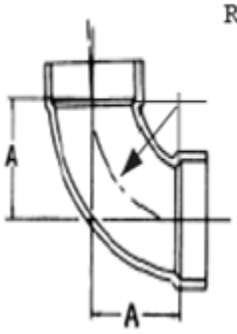
(8) PIPING CHANGES IN DIRECTION. Changes in the direction of drain piping shall be accomplished in accordance with the requirements of this subsection. (a) *Fittings.* All changes in direction of flow in drain piping shall be made by the appropriate use of 45 degree wyes, long or short sweep quarter bends, sixth, eighth, or sixteenth bends, or by a combination of these or other equivalent fittings. Except as provided in subds. 1. to 3., fittings which change the direction of flow for drain piping 8” or less in diameter shall conform to the minimum radii specified in Table 382.30−4.

Table 382.30-4
Minimum Radii of Fittings (in inches)

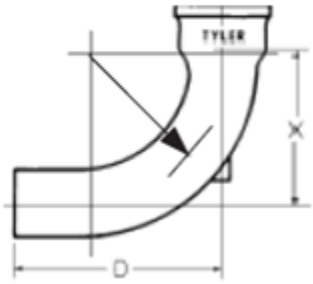
Diameter of pipe (inches)	Changes in Direction of Flow	
	Horizontal to Vertical	Vertical to Horizontal and Horizontal to Horizontal
1–1/4	1–1/8	2–1/4
1–1/2	1–3/8	2–3/4
2	1–7/8	3–1/4
3	2–7/8	4–1/16
4	3–3/4	4–7/8
5	4–1/2	6–1/2
6	5	7
8	6	8

A-382.30 (8) MEASURING RADIUS OF A FITTING.

Radius of a plastic DWV fitting



Radius of hub & spigot fitting



106. All changes in direction of flow in drain piping shall be made by the appropriate use of 45 degree wyes, long or short sweep quarter bends, sixth, eighth, or sixteenth bends, or by _____.
    a. a combination of these
    b. other equivalent fittings
    c. flexible connectors
    d. both a or b
107. The minimum radii for a 5” diameter pipe going from horizontal to vertical would be?
    a. none of the above
    b. 5”
    c. 4 ½”
    d. 6/1/2”
108. The minimum radii for a 5” diameter pipe going from vertical to horizontal would be?
    a. none of the above
    b. 5”
    c. 4 ½”
    d. 6/1/2”
109. The minimum radii for a 5” diameter pipe going from vertical to vertical would be?
    a. none of the above
    b. 5”
    c. 4 ½”
    d. 6/1/2”

(10) SUMPS, EJECTORS AND PUMPS. (a) *Sumps.* 1. 'General.' All sanitary building subdrains shall discharge into an approved, vented sump with an airtight cover. The sump shall be so located as to receive the wastewater by gravity flow, and shall be located at least 25 feet from any water well or as otherwise approved by the department of natural resources.
2. 'Capacity.' Except as provided in pars. (c) and (d), the minimum capacity of the sump shall be determined in accordance with the provisions of subd. 2. a. to e.
a. The water supply fixture unit method shall be used to determine peak input flow in gallons per minute; only the fixtures that drain to the sump shall be included. **Note:** When converting water fixture units to gallons per minute it is permissible to calculate the load as a supply system with predominantly flush tanks.
b. The capacity of the sump shall be such that the pump when actuated by the lowest "pump on" switch runs at least 20 seconds.
c. Between the highest "pump on" switch level and the sump inlet, the sump shall hold the amount of input that exceeds the discharge of the pumping equipment in a 5 minute peak input period, but in no case shall the vertical distance between the switch and the inlet be less than 3".
d. The low water level shall be maintained in accordance with the pump manufacturer's requirements, but shall not be less than 4" above the sump bottom.
e. Sumps containing one pump shall have an inside diameter of at least 24". Sumps containing 2 pumps shall have an inside diameter of at least 30". **Note:** See Appendix for further explanatory material.
3. 'Vents.' All sumps and all drains leading to a sump shall be vented in accordance with SPS 382.31.
4. 'Materials.' All sumps shall be constructed in a watertight manner of approved materials in accordance with SPS 384.
5. 'Removable covers.' Penetrations through the top of removable sump covers shall be limited to those for the electrical supply, the vent piping and the discharge piping for the pump or pumps.

110. All sanitary building subdrains shall discharge into an _____ .
a. approved sump
b. vented sump
c. airtight covered sump
d. all of the above

111. The sump shall be so located as to receive the wastewater by gravity flow, and shall be located at least ____ feet from any water well or as otherwise approved by the department of natural resources.
a. 10
b. 15
c. 25
d. 20

112. The capacity of the sump shall be such that the pump when actuated by the lowest "pump on" switch runs at least ___ seconds.
a. 10
b. 15
c. 25
d. 20

113. Between the highest "pump on" switch level and the sump inlet, the sump shall hold the amount of input that exceeds the discharge of the pumping equipment in a ___ minute peak input period.
a. 3
b. 5
c. 4
d. none of the above

114. Between the highest “pump on” switch level and the sump inlet the vertical distance between the switch and the inlet be less than ___”.

a. 3
b. 5
c. 4
d. none of the above

115. The low water level shall be maintained in accordance with the pump manufacturer’s requirements, but shall not be less than ___” above the sump bottom.

a. 3
b. 5
c. 4
d. none of the above

116. Sumps containing one pump shall have an inside diameter of at least ___”.

a. 18
b. 24
c. 30
d. none of the above

117. Sumps containing 2 pumps shall have an inside diameter of at least ___”.

a. 18
b. 24
c. 30
d. none of the above

118. Penetrations through the top of removable sump covers shall be limited to those for the_____.

a. electrical supply
b. vent piping
c. discharge piping for the pump or pumps
d. all of the above

(b) *Ejectors and pumps.* 1. ‘Where required.’ The liquid from all sanitary building sumps shall be lifted and discharged into the building sanitary drain system by automatic ejectors, pumps or any other equally efficient method approved by the department.

2. ‘Duplex equipment.’ a. Duplex ejector or pumping equipment shall be installed in a public building where 3 or more water closets or more than 20 drainage fixture units discharge into a sump.

b. Duplex ejector or pumping equipment shall be installed where the sanitary wastes of 2 or more one−or 2−family dwellings discharge into a sump.

c. Where duplex ejector or pumping equipment is installed, appropriate devices shall be installed to automatically alternate operation of the pumps or ejectors and to operate both pumps or ejectors when one unit cannot handle the load.

d. Where duplex pumping equipment is installed, an audible or visual alarm system with a manual control reset shall be installed to indicate pump failure.

3. ‘Size.’ The size and design of an ejector or pump shall be determined by the capacity of the sump to be served, the discharge head and discharge frequency. All ejectors and pumps shall provide a minimum flow velocity of 2 feet per second in the forced discharge piping. **Note:** See Appendix for velocity in relation to flow rate by various pipe sizes. **Note:** Ejectors or pumps discharging to septic tanks may disturb the normal settling properties of the tank environment; contact the Safety and Buildings Division for more information.

a. All sewage grinder pumps shall have a minimum 11/4” diameter discharge opening and discharge piping.

b. All nongrinder−type sewage pumps serving water closets shall be capable of passing a 2” diameter solid ball and shall have a minimum 2” diameter discharge opening and discharge piping. All other pumps

handling sanitary wastes shall be rated by the manufacturer as an effluent pump, shall be capable of passing a ½" diameter solid ball and shall have a minimum 11/4" diameter discharge opening and discharge piping.
4. 'Discharge connections.' a. The discharge pipe from the ejector or pump shall be connected to the gravity drain by means of a wye pattern fitting. Where the fitting connects to a horizontal drain, the bottom of the wye branch of the fitting shall be located above the horizontal center line.
b. With the exception of exterior sumps, a full flow check valve shall be installed in the discharge piping from each ejector or pump.
c. Where duplicate ejector or pumping equipment is installed, each discharge pipe from an ejector or pump shall be provided with a gate or ball type valve installed downstream of each full flow check valve.
5. 'Discharge pipe air relief.' Air relief valves shall be provided at all high points in the discharge piping of an ejector or pump where the piping arrangement creates an air trap.
6. 'Prohibited connections.' No fixtures may be connected to the discharge pipe between the ejector or pump and the point where it enters the gravity drain.
7. 'Maintenance.' All ejectors, pumps and like appliances shall receive care as needed to keep them in a satisfactory operating condition.

119. All nongrinder−type sewage pumps serving water closets shall be capable of passing a ___" diameter solid ball.
a. 1
b. 1 ¼
c. 1 ½
d. 2
120. All sewage grinder pumps shall have a minimum ____" diameter discharge opening and discharge piping.
a. 1
b. 1 ¼
c. 1 ½
d. 2
121. All other pumps handling sanitary wastes shall be rated by the manufacturer as an effluent pump, shall be capable of passing a ___" diameter solid ball and shall have a minimum ____" diameter discharge opening and discharge piping.
a. 1-1 ¼
b. ½ -1 ¼
c. ½-1 ½
d. ½-2
122. With the exception of exterior sumps, a full flow _____shall be installed in the discharge piping from each ejector or pump.
a. wye fitting
b. check valve
c. clean out
d. none of the above
123. Where duplicate ejector or pumping equipment is installed, each discharge pipe from an ejector or pump shall be provided with a _____ type valve installed downstream of each full flow check valve.
a. gate
b. ball
c. both a or b
d. none of the above
124. Fixtures may be connected to the discharge pipe between the ejector or pump and the point where it enters the gravity drain.

a. true
b. false

125. _____ ejector or pumping equipment shall be installed where the sanitary wastes of 2 or more one−or 2−family dwellings discharge into a sump.
a. Single
b. Duplex
c. Triplex
d. none of the above

126. Duplex ejector or pumping equipment shall be installed in a public building where _____ discharge into a sump.
a. 3 or more water closets
b. more than 20 drainage fixture units
c. both a or b
d. none of the above

127. Where duplex pumping equipment is installed, an _____ alarm system with a manual control reset shall be installed to indicate pump failure.
a. audible
b. visual
c. both a or b
d. none of the above

128. Where duplex ejector or pumping equipment is installed, appropriate devices shall be installed to manually alternate operation of the pumps or ejectors and to operate both pumps or ejectors only if the one unit cannot handle the load.
a. true
b. false

(c) *Prefabricated pumps and sump systems.* The minimum capacity of a prefabricated pump and sump system shall be determined in accordance with all of the following:
1. The water supply fixture unit, wsfu, method shall be used to determine peak input flow in gallons per minute. The peak input shall include all the fixtures that drain to the sump.
2. Unless storage is provided as specified in par. (a) 2., the capacity of the prefabricated pump and sump system shall accommodate the peak input flow.
3. The low water level shall be maintained in accordance with the pump manufacturer's requirements.
(d) *Exterior sumps.* The minimum capacity of exterior sumps shall be determined in accordance with all of the following:
1. Peak input flow in gallons per minute shall be determined in accordance with either of the following:
a. The water supply fixture unit, wsfu, method of all the fixtures that drain to the sump.
b. The provisions as specified in SPS 383.43 (2) through (6).
2. In lieu of providing the duplex pumping equipment as specified in par. (b) 2., a one−day holding capacity may be provided above a high level alarm when installed on a simplex system.

129. Unless storage is provided as specified in par. (a) 2., the capacity of the prefabricated pump and sump system shall accommodate the _____ input flow.
a. daily
b. average
c. peak
d. none of the above

130. The water supply fixture unit, wsfu, method shall be used to determine _____ input flow in gallons per minute.
a. daily

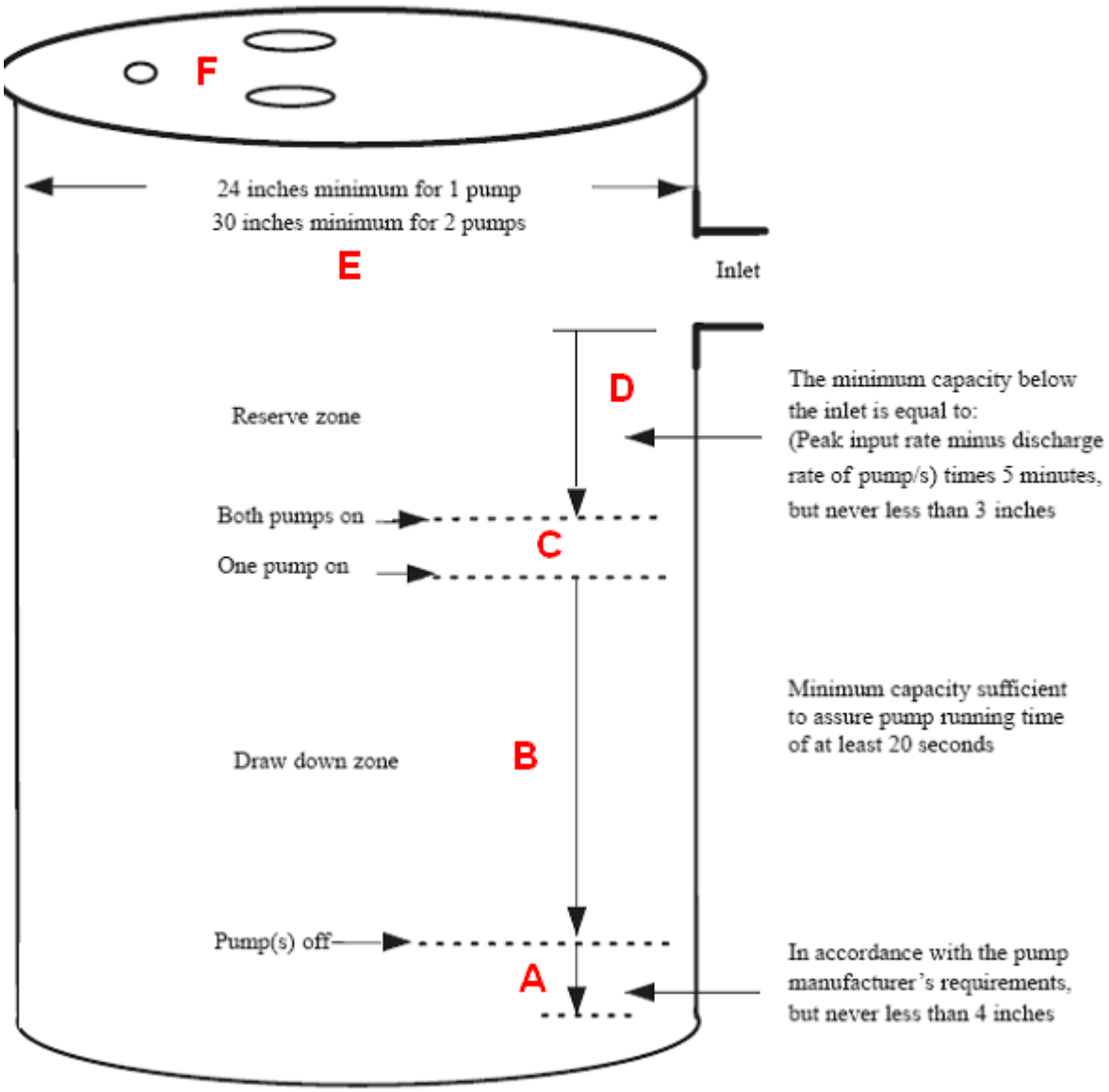
b. average
c. peak
d. none of the above

131. *Exterior sumps.* The minimum capacity of exterior sumps shall be determined in accordance with all of the following: In lieu of providing the duplex pumping equipment as specified in par. (b) 2., a ____day holding capacity may be provided above a high level alarm when installed on a simplex system.

a. ½
b. one
c. two
d. three

DETERMINING REQUIRED CAPACITY OF SANITARY SUMP.

A-382.30(10) (a)



132. A above should never be less than _____"

a. 3
b. 4
c. 20

d. 30

133. B above should never be less than ____ seconds
    a. 3
    b. 4
    c. 20
    d. 30
134. C above should never be less than _____”
    a. 30
    b. 4
    c. 20
    d. none of the above
135. D above should never be less than _____”
    a. 3
    b. 4
    c. 20
    d. 30
136. E above for two pumps should never be less than _____”
    a. 30
    b. 4
    c. 20
    d. none of the above
137. The F holes above may allow a water softeners discharge to enter at this location.
    a. true
    b. false

A-382.30 (10) (a) SUMPS. **Capacity of Sumps (in gallons)**

Diameter of sump in inches	Volume in gal/ft	Diameter of sump in inches	Volume in gal/ft
24	23.5	41	68.6
25	25.5	42	72.1
26	27.6	43	75.5
27	29.7	44	79.1
28	32.0	45	82.7
29	34.3	46	86.5
30	36.8	47	90.2
31	39.2	48	94.0
32	41.8	54	119.0
33	44.5	60	147.0
34	47.2	66	178.0
35	50.0	72	211.5
36	52.8	78	248.4
37	55.9	84	288.1
38	59.0	90	330.8
39	62.1	96	376.3
40	65.3	108	477.3

138. The volume of a 36” diameter sump would be ____?
    a. 78

b. 52.8
c. 50
d. 55.9

VELOCITY AND FLOW RELATIONSHIP MAINTAINING 2 FEET PER SECOND.

A-382.30 (10) (b) 3

Schedule 40 PVC

Velocity And Flow Relationship Maintaining 2 Feet Per Second

Nominal Inside Diameter (in inches)	Actual Inside Diameter (in inches)	GPM creating 2 ft. per second
1¼	1.38	9
1½	1.61	13
2	2.067	21
3	3.068	46
4	4.026	79

139. The actual inside diameter of a 2" pipe would be ____".
a. 1.38
b. 1.61
c. 2.067
d. 2

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(11) BUILDING DRAINS AND BUILDING SEWERS. (a) *Limitations.*
No building sewer may pass through or under a building to serve another building, unless:
1. The building sewer serves farm buildings or farm houses, or both, which are all located on one property; or
2. The building sewer or private interceptor main sewer serves buildings located on the same property and a document, which indicates the piping and distribution arrangement for the property and buildings, shall be recorded with the register of deeds no later than 90 days after installation.
(b) *Building drains.* 1. 'Elevation.' a. All building drains shall be installed below the lowest floor levels on which fixtures may be installed if the public sewer, POWTs or private interceptor main sewer elevation permits.
b. Where any portion of an above ground building drain discharges to a vertical pipe, the building drain shall connect to the building sewer at an elevation at least 30" above the basement floor. **Note:** See Appendix for further explanatory material.
2. 'Backwater protection.' A building drain subject to backflow or backwater shall be protected with a backwater valve or with a sump with pumping equipment in accordance with sub. (10).
a. Backwater valves, when fully open, shall have a capacity not less than that of the pipes in which installed.
b. Backwater valves shall be so located as to be readily accessible for cleaning.
3. 'Floor drain required.' a. Where a plumbing fixture or appliance is located on a floor which is entirely below grade, a floor drain shall be installed to serve that floor. b. In any room containing the recessed or concealed portions of sterilizers located in health care or related facilities, at least one floor drain connecting to the drainage system shall be installed in a manner to adequately drain the entire floor area.

140. No building sewer may pass through or under a building to serve another building, unless:
a. The building sewer serves farm buildings or farm houses, or both, which are all located on one property

b. The building sewer or private interceptor main sewer serves buildings located on the same property and a document, which indicates the piping and distribution arrangement for the property and buildings, shall be recorded with the register of deeds no later than 90 days after installation.

c. both a or b

d. none of the above

141. a. All building drains shall be installed below the lowest floor levels on which fixtures may be installed if the _____ elevation permits.

a. public sewer

b. POWTs

c. private interceptor main sewer

d. all of the above

142. A building drain subject to backflow or backwater shall be protected with a backwater valve or with a sump with pumping equipment shall include.

a. Backwater valves, when fully open, shall have a capacity not less than that of the pipes in which installed.

b. Backwater valves shall be so located as to be readily accessible for cleaning.

c. both a & b

d. none of the above

143. Where a _____ is located on a floor which is entirely below grade, a floor drain shall be installed to serve that floor.

a. plumbing fixture

b. appliance

c. both a or b

d. none of the above

(c) *Building sewers.* 1. 'Minimum depth.' a. The top of a building sewer shall be located at a depth of not less than 42" below finished grade, except as provided in subd. 1. b. or subd. 2.

b. The top of a building sewer which discharges to a septic tank, holding tank or grease interceptor shall be located at a depth of not less than 18" below finished grade.

2. 'Protection from frost.' a. Except as provided in subd. 2. c. to e., a building sewer or private interceptor main sewer shall be protected from frost in accordance with subd. 3. in areas where the top of the building sewer or private interceptor main sewer is located less than 60" below a surface area from which snow will be cleared.

b. Except as provided in subd. 2. c. to e., a building sewer or private interceptor main sewer shall be protected from frost in accordance with subd. 3. in areas where the top of the building sewer or private interceptor main sewer is located less than 42" below a surface area which snow will not be cleared.

c. Where a building sewer or private interceptor main sewer discharges to a holding tank, POWTs treatment tank or grease interceptor, the portion of a building sewer or private interceptor main sewer which is within 30 feet from the connecting building drain and which is under a surface area from which snow will not be cleared shall not be required to be protected from frost.

d. Frost protection for a building sewer shall not be required where the predicted depth of frost as determined from Figure 382.30−1 and Table 382.30−6 does not extend below the top of the building sewer.

e. Where a building sewer or private interceptor main sewer is installed to serve summer use public facilities, frost protection requirements shall not apply. **Note:** This exemption applies to frost sleeves as provided in SPS 382.35 (5)(a) 2.

3. 'Insulation for building sewers.' Where required by subd. 2. a. or b., building sewer or private interceptor main sewer insulation for frost protection shall be provided in accordance with one of the methods specified in subd. 3. a. to d. a. Extruded polystyrene foam insulation shall be installed at

a depth of at least 18” below finished grade and at least 6” above the top of the sewer pipe. The minimum thickness and width of the foam insulation shall be determined from Figure 382.30−1 and Tables 382.30−5 to 382.30−7. If the insulation is to be installed more than 6” above the top of the sewer, the number of inches exceeding 6” shall be added to the width of insulation determined from Table 382.30−7.
b. Extruded polystyrene foam insulation shall be installed using a box method. The 3−sided box shall be formed with 3 lengths of polystyrene foam insulation where the top of the box extends horizontally to the farthest edge of both vertical sides. The insulation shall be installed at or below a depth of at least 12” below finished grade and 6” above the top and 6” from each side of the building sewer or private interceptor main sewer. The minimum thickness of the foam insulation shall be determined from Figure 382.30−1 and Table 382.30−5. **Note:** See Appendix for further explanatory material.
c. Lightweight insulating concrete shall be installed to the depth of the spring line of the sewer and shall extend laterally at least 6” on both sides of the sewer. The minimum thickness of the insulating concrete shall be determined from Figure 382.30−1 and Table 382.30−5. The thickness shall be measured from the top of the sewer. The top of the insulation shall be installed at least 12” below finished grade.
d. Alternative methods of frost protection shall be approved by the department.

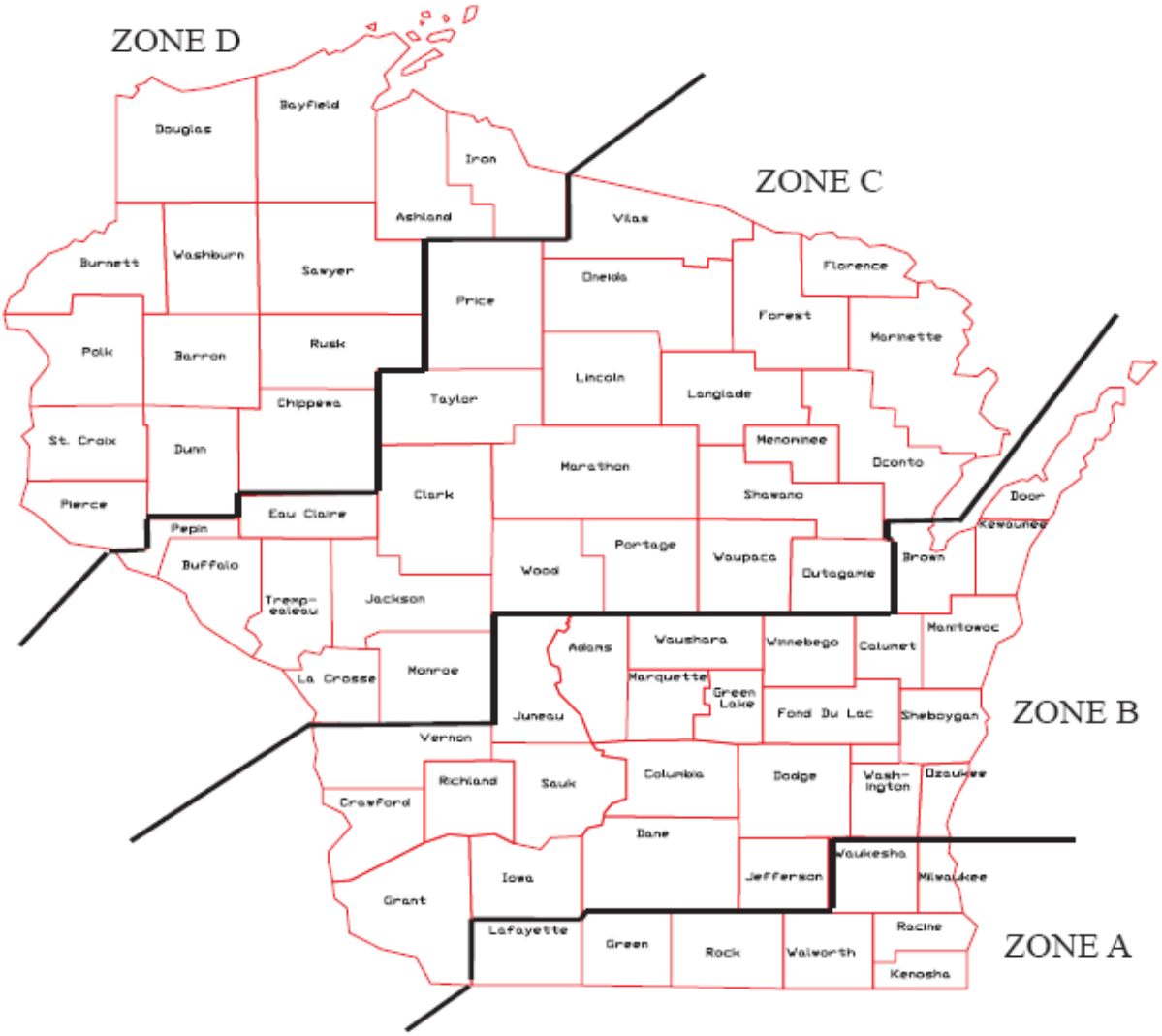
144. a building sewer or private interceptor main sewer shall be protected from frost in accordance with subd. 3. in areas where the top of the building sewer or private interceptor main sewer is located less than ____” below a surface area from which snow will be cleared.
a. 42
b. 48
c. 60
d. 18

145. The top of a building sewer which discharges to a septic tank, holding tank or grease interceptor shall be located at a depth of not less than ____” below finished grade.
a. 42
b. 48
c. 60
d. 18

146. The top of a building sewer shall be located at a depth of not less than ____” below finished grade, except as provided in subd. 1. b. or subd. 2.
a. 42
b. 48
c. 60
d. 18

147. Building sewer or private interceptor main sewer shall be protected from frost in accordance with subd. 3. in areas where the top of the building sewer or private interceptor main sewer is located less than ____” below a surface area which snow will not be cleared.
a. 42
b. 48
c. 60
d. 18

148. Where a building sewer or private interceptor main sewer discharges to a holding tank, POWTs treatment tank or grease interceptor, the portion of a building sewer or private interceptor main sewer which is within ___ feet from the connecting building drain and which is under a surface area from which snow will not be cleared shall not be required to be protected from frost.
a. 30
b. 48
c. 60
d. 18



149. Burnett County is in zone ____?
    a. A
    b. B
    c. C
    d. D

Table 382.30-5 **Minimum Thickness of Insulation**

Frost Protection Zone	Extruded Polystyrene Foam (in inches)	Insulating Concrete (in inches)
A	1.0	6
B	1.5	9
C	2.0	12
D	2.5	15

150. Zone C requires ____" of insulated concrete?
    a. 6
    b. 9
    c. 12
    d. 15

151. Zone C requires ____" of extruded polystyrene foam?

a. 1
b. 1 1/2
c. 2
d. 2.5

Table 382.30-6 Predicted Depth of Frost in Various Types of Backfill Soil (in feet)

Soil Type	Frost Protection Zone			
	A	B	C	D
Clay, Clay Loam	2.5	3.0	3.5	4.0
Silt Loam, Silty Clay Loam	3.5	4.0	4.5	5.5
Sandy Clay Loam	4.0	4.5	5.5	6.0
Sandy Loam, Loamy Sand	4.5	5.0	6.0	6.5
Sand	5.0	5.5	6.5	7.5
Gravelly Sand	6.0	7.5	9.0	10.0

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152. The predicted depth of frost for sandy clay loam in zone D would be ___'.
a. 4
b. 4.5
c. 5.5
d. 6

Table 382.30-7 Minimum Width of Extruded Polystyrene Foam Insulation (in feet)

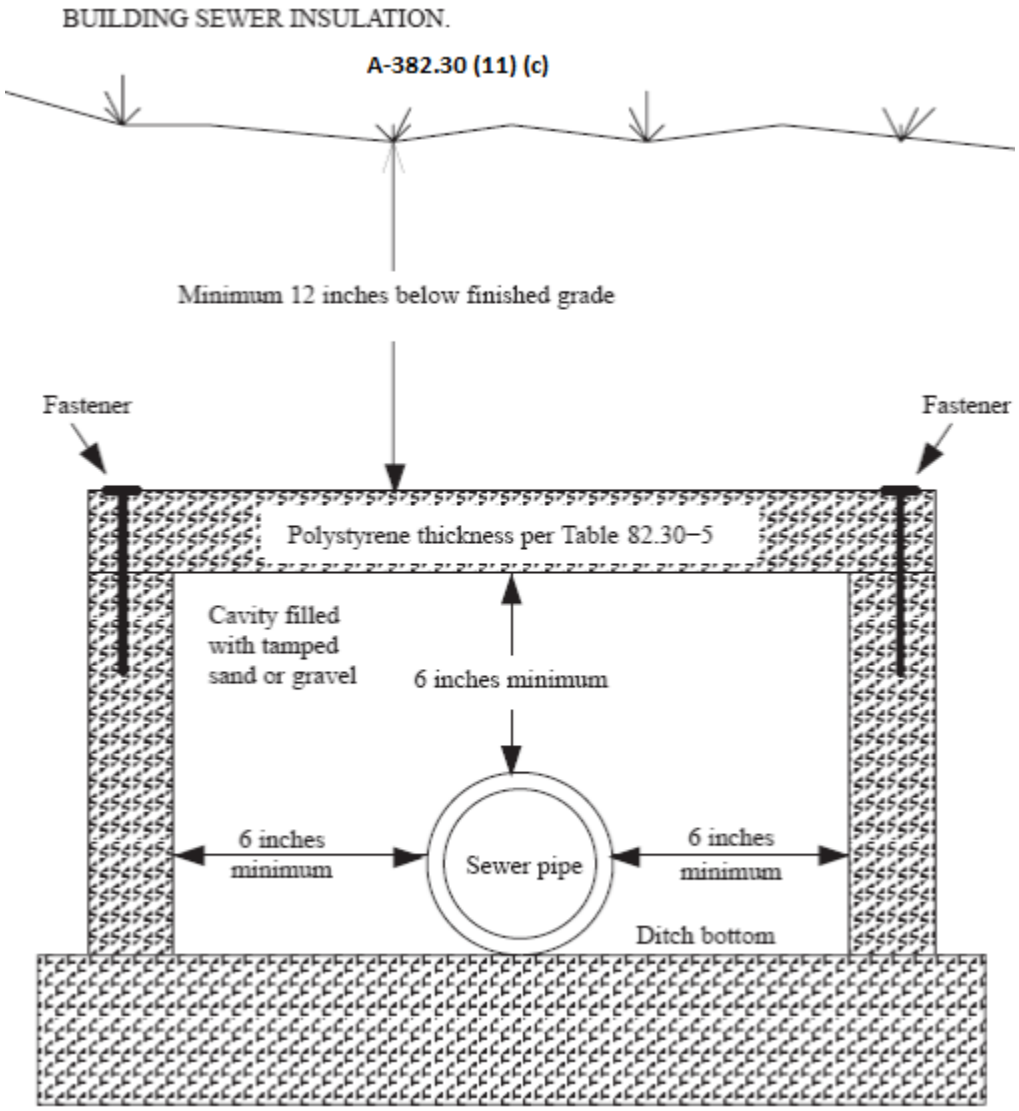
Predicted Depth of Frost (feet)	Depth of Sewer (in feet)					
	2.0	2.5	3.0	3.5	4.0	4.5
2.5	2	NR				
3.0	3	2	NR			
3.5	4	3	2	NR		
4.0	5	4	3	2	NR	
4.5	6	5	4	3	2	NR
5.0	7	6	5	4	3	2
5.5	8	7	6	5	4	3
6.0	9	8	7	6	5	4
6.5	10	9	8	7	6	5
7.0	10	10	9	8	7	6
7.5	10	10	10	9	8	7
8.0	10	10	10	10	9	8
8.5	10	10	10	10	10	9
9.0	10	10	10	10	10	10
10.0	10	10	10	10	10	10

NR means Not Required

153. The minimum width of extruded polystyrene foam insulation for a sewer with 3' of depth and with a predicted depth of frost at 6' would be ____?
a. 5
b. 6
c. 7
d. NR

154. The minimum width of extruded polystyrene foam insulation for a sewer with 3' of depth and with a predicted depth of frost at 3' would be ____?

a. 5
b. 6
c. 7
d. NR



155. The minimum depth at the top of the extruded polystyrene foam insulation below finished grade would be ____?

a. 6
b. 9
c. 12
d. NR

156. The minimum depth from the bottom of the extruded polystyrene foam insulation to the top of the sewer pipe would be ____?

a. 6
b. 9
c. 12
d. NR

(e) *Installation of building drains and building sewers.* 1. 'Trenching.' All excavations for building drains and building sewers shall be open trench work, unless otherwise permitted by local ordinance or accepted by the local inspector.
2. 'Stable bottom.' Where the bottom of the trench can be maintained in a stable condition and free of water during the time of installation the building drain and the building sewer shall be bedded and initially backfilled to comply with all the following requirements:
a. Where the trench bottom does not contain stone larger than one inch in size or where bedrock is not encountered, the trench may be excavated to grade.
b. Where stone larger than one inch size or when bedrock is encountered, the trench shall be excavated to a depth at least 3 inches below the grade elevation and shall be brought back to grade with a bedding of sand, gravel or crushed stone that shall be of a size that all the material shall pass a ¾ inch sieve.
c. Bedding shall be sufficiently dry and hand or mechanically compacted to a minimum of 90 percent standard proctor density.
d. Initial backfill to a depth of 12 inches over the pipe shall be sand, crushed stone or excavated material which is neither corrosive nor organic in nature.
e. Initial backfill shall be of a size that passes a one−inch sieve.
f. A concrete floor may be placed over a building drain having less than 12 inches of initial backfill.
g. Initial backfill shall be placed in increments not to exceed 6 inches in depth.
h. Initial backfill shall be well tamped for the full width of the trench and length of the sewer.
3. 'Unstable bottom.' Where a mucky or unstable bottom is encountered in the trench, the required dry and stable foundation conditions shall be provided by providing one of the following options:
a. Sheathing shall be driven and left in place to a depth of 48 inches below the trench bottom or to solid foundation to a lesser depth.
b. Removal of wet and yielding material to a depth of 24 inches or to solid material and replacement of the unstable material with limestone screenings, pea gravel or equivalent material.
c. Install a longitudinally reinforced concrete cradle the width of the trench and at least 3 inches thick.
d. Install a longitudinally reinforced concrete slab the width of the trench and at least 3 inches thick.
e. Backfill and bedding shall comply with subd. 2. d. to h.
4. 'Backfill completion.' Care shall be exercised in placing the balance of the backfill to prevent breakage of the pipe. Large boulders or rock, concrete slabs, or frozen masses shall not be used in the backfill. At least 36" of backfill cover shall be provided over the top of the pipe before the pipe trench is heel−loaded.
5. 'Pipe openings protected.' The ends of all pipes not immediately connected shall be closed so as to prevent the introduction of earth or drainage from an excavation.

157. Where stone larger than one inch size or when bedrock is encountered, the trench shall be excavated to a depth at least ___ inches below the grade elevation and shall be brought back to grade with a bedding of sand, gravel or crushed stone that shall be of a size that all the material shall pass a ¾ inch sieve.
a. 2
b. 3
c. 6
d. 12
158. Where the trench bottom does not contain stone larger than ____ inch in size or where bedrock is not encountered, the trench may be excavated to grade.
a. ¾
b. 1
c. 1/1/2
d. 2
159. Initial backfill to a depth of ___ inches over the pipe shall be sand, crushed stone or excavated material which is neither corrosive nor organic in nature.
a. 2

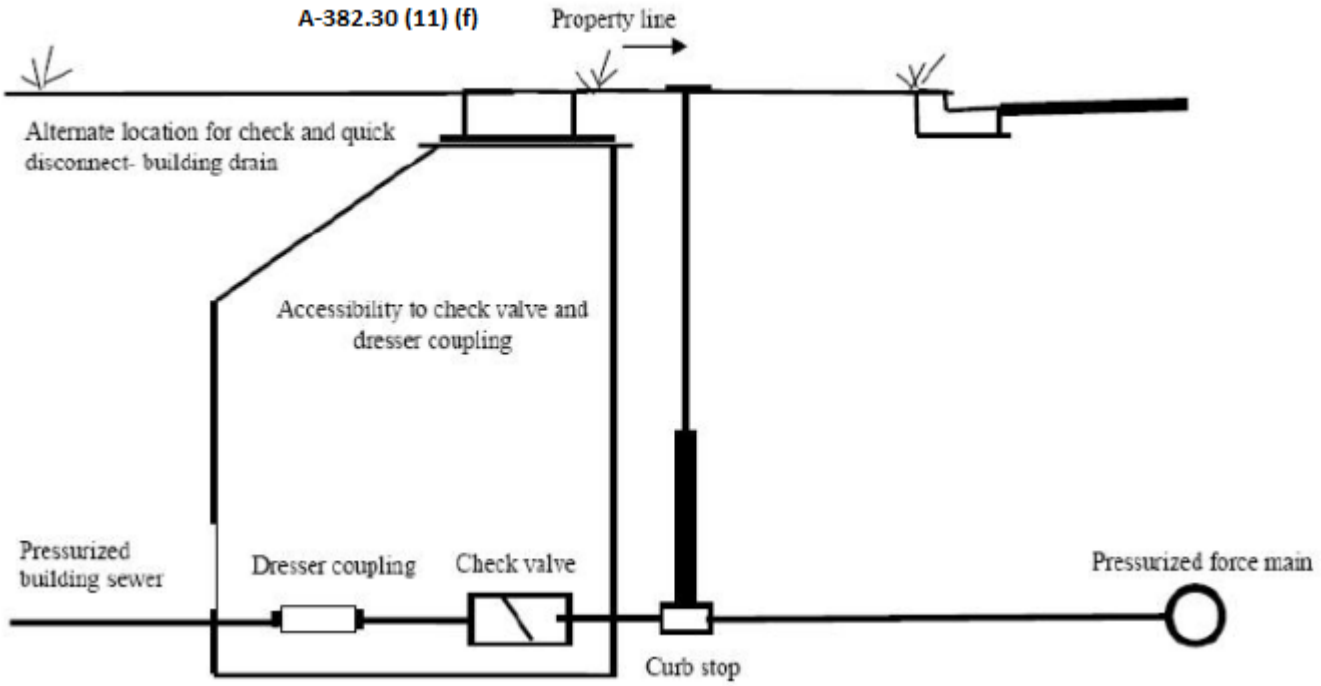
b. 3
c. 6
d. 12

160. Initial backfill shall be _____.
a. placed in increments not to exceed 6 inches in depth.
b. well tamped for the full width of the trench and length of the sewer.
c. of a size that passes a one−inch sieve.
d. all of the above

161. Unstable bottom.' Where a mucky or unstable bottom is encountered in the trench, the required dry and stable foundation conditions shall be provided by providing one of the following options:
a. a. Sheathing shall be driven and left in place to a depth of 48 inches below the trench bottom or to solid foundation to a lesser depth.
b. Removal of wet and yielding material to a depth of 24 inches or to solid material and replacement of the unstable material with limestone screenings, pea gravel or equivalent material.
c. Install a longitudinally reinforced concrete cradle the width of the trench and at least 3 inches thick.
d. all of the above

162. Unstable bottom.' Where a mucky or unstable bottom is encountered in the trench, the required dry and stable foundation conditions shall be provided by providing one of the following options:
a. d. Install a longitudinally reinforced concrete slab the width of the trench and at least 6 inches thick.
b. Backfill and bedding shall comply with subd. 12. a. to h.
c. both a or b
d. none of the above

163. 'Pipe openings protected.' The ends of all pipes not immediately connected shall be closed so as to prevent the introduction of _____.
a. earth
b. drainage from an excavation
c. both a or b
d. none of the above



(f) *Connection to public sewer.* The connections of building sewers to public sewers shall be in accordance with conditions of approval for the public sewer granted by the department of natural resources under s. 281.41, Stats.

1. 'Gravity public sewer.' When a building sewer connection to the public sewer is not found within 3 feet of the point designated by the local governing body or its authorized representative, the connection shall be made in accordance with one of the provisions specified in subd. 1. a. to d.

a. A saddle fitting approved by the department and acceptable to the municipality or sanitary district shall be installed.

b. Where acceptable to the municipality or sanitary district a portion of the main sewer may be removed and a tee or wye fitting approved by the department may be inserted with compression joints in the public sewer acceptable to the municipality or the sanitary district. The insertion shall be made under the supervision of the authorized representative of the municipality or the sanitary district.

c. When the public sewer is concrete or clay, the end of the connecting sewer may be set upon or in an opening cut into the top half of the public sewer, but shall not protrude into the public sewer. The connection shall be secured by encasing the main sewer pipe and the connection in concrete at least 3" thick so as to assure permanency of the connection and adequate backing of the public sewer pipe.

d. In lieu of the use of a fitting and in the event that an opening cannot be located in the top half of the public sewer, a length of concrete or clay public sewer pipe may be removed and a section with a wye fitting shall be inserted in its place. The joints at the ends of the section shall be encased in concrete at least 3" thick. The connection or insertion shall be made under the supervision of the authorized representative of the municipality or the sanitary district.

2. 'Pressurized public sewer.' Where a forced building sewer discharges to a pressurized public sewer all of the following requirements shall apply:

a. A curb stop shall be installed on the same property as close as possible to the connection to the common forced main sewer.

b. A check valve shall be installed in the pressurized building drain or building sewer.

c. An accessible quick disconnect shall be installed upstream of the check valve. **Note:** See Appendix for further explanatory material.

(g) *Prohibited installations.* 1. 'harmful discharge.' No person may connect to a public sewer any building drain or building sewer through which is discharged any substance likely to cause undue corrosion, obstruction, nuisance, explosion or interference with sewage treatment processes.
2. 'Storm water and clear water connections.' Except as provided in SPS 382.36 (3), storm drain piping and clear water drain piping may not discharge to a sanitary building drain which connects to a publicly−owned treatment works. **Note:** See SPS 382.36 for provisions relative to storm sewers.

164. When a building sewer connection to the public sewer is not found within 3 feet of the point designated by the local governing body or its authorized representative, the connection may be made in with a saddle fitting approved by the department and acceptable to the _____ shall be installed.

a. municipality
b. sanitary district
c. both a or b
d. none of the above

165. When a building sewer connection to the public sewer is not found within 3 feet of the point designated by the local governing body or its authorized representative, the connection may be made where acceptable to the municipality or sanitary district a portion of the main sewer may be removed and a _____ fitting approved by the department may be inserted with compression joints in the public sewer acceptable to the municipality or the sanitary district. The insertion shall be made under the supervision of the authorized representative of the municipality or the sanitary district.

a. tee or wye
b. elbow
c. reducer
d. all of the above

166. When a building sewer connection to the public sewer is not found within 3 feet of the point designated by the local governing body or its authorized representative, the connection may be made when the public sewer is concrete or clay, the end of the connecting sewer may be set upon or in an opening cut into the top half of the public sewer, but shall not protrude into the public sewer. The connection shall be secured by encasing the main sewer pipe and the connection in concrete at least ___" thick so as to assure permanency of the connection and adequate backing of the public sewer pipe.

a. 2
b. 3
c. 6
d. 12

167. When a building sewer connection to the public sewer is not found within 3 feet of the point designated by the local governing body or its authorized representative, the connection may be made in lieu of the use of a fitting and in the event that an opening cannot be located in the top half of the public sewer, a length of concrete or clay public sewer pipe may be removed and a section with a wye fitting shall be inserted in its place. The joints at the ends of the section shall be encased in concrete at least ___" thick. The connection or insertion shall be made under the supervision of the authorized representative of the municipality or the sanitary district.

a. 2
b. 3
c. 6
d. 12

168. 'Pressurized public sewer.' Where a forced building sewer discharges to a pressurized public sewer all of the following requirements shall apply:

a. A curb stop shall be installed on the same property as close as possible to the connection to the common forced main sewer.
b. A check valve shall be installed in the pressurized building drain or building sewer.

c. An accessible quick disconnect shall be installed upstream of the check valve.

d. all of the above

169. *Prohibited installations.* 1. 'harmful discharge.' No person may connect to a public sewer any _____ through which is discharged any substance likely to cause undue corrosion, obstruction, nuisance, explosion or interference with sewage treatment processes.

a. building drain

b. building sewer

c. both a or b

d. none of the above

170. Storm water and clear water connections.' Except as provided in SPS 382.36 (3), storm drain piping and clear water drain piping may discharge to a sanitary building drain which connects to a publicly−owned treatment works.

a. true

b. false

(h) *Locating requirements.* A means to locate buried non−metallic sewers and private interceptor main sewers discharging to municipal mains shall be accomplished in accordance with one of the following options: **Note:** See the appendix for further information.

1. A tracer wire shall be installed in accordance with all of the following:

a. Tracer wire shall be installed along the length of the non−metallic pipe.

b. Tracer wire shall be a minimum of 18 gauge, insulated, single−conductor copper wire or equivalent.

c. Tracer wire shall be located directly above and within 6 inches of the non−metallic pipe.

d. Tracer wire shall be accessible and locatable within the owner's property at 400−foot intervals or increments thereof.

e. Exterior access locations shall include a means of protecting the tracer wire.

f. In−ground sleeves shall be installed as provided in SPS 382.35 (5) (a) 2. c. and d.

g. Where tracer wire is more than 6 inches from the pipe, tracer wire insulation color shall comply with subd. 1. h.

h. Tracer wire insulation color for non−metallic sewer pipe shall be green.

i. Tracer wire conductivity shall be tested prior to use.

j. Conductive warning tape may not be utilized in lieu of tracer wire.

2. Global positioning system data shall be recorded with the municipality where the non−metallic pipe is installed.

3. Another equally−effective means acceptable to the department shall be employed to mark the location of the non−metallic pipe.

382.36(7)10. a. A means to locate buried non−metallic storm building sewers and private interceptor main sewers that discharge to municipal mains shall be provided in accordance with the options under SPS 382.30 (11) (h), except as provided in subd. 10. b. b. Tracer wire insulation color for non−metallic storm pipe shall be brown.

382.40(8)(k) *Locating requirements.* 1. A means to locate buried nonmetallic water services and private water mains connected to municipal supply systems shall be provided in accordance with the options under SPS 382.30 (11) (h), except as provided in subds. 2. and 3.

2. Tracer wire insulation color for non−metallic, potable water pipe shall be blue.

171. A means to locate buried non−metallic sewers and private interceptor main sewers discharging to municipal mains shall be accomplished in accordance with one of the following options: 1. A tracer wire shall be installed in accordance with all of the following:

a. Tracer wire shall be installed along the length of the non−metallic pipe.

b. Tracer wire shall be a minimum of 20 gauge, insulated, single−conductor copper or aluminum wire or equivalent.

c. both a or b

d. none of the above

172. A means to locate buried non−metallic sewers and private interceptor main sewers discharging to municipal mains shall be accomplished in accordance with one of the following options: 1. A tracer wire shall be installed in accordance with all of the following:

a. Tracer wire shall be located directly above and within 6 inches of the non−metallic pipe.

b. d. Tracer wire shall be accessible and locatable within the owner's property at 500−foot intervals or increments thereof.

c. both a or b

d. none of the above

173. A means to locate buried non−metallic sewers and private interceptor main sewers discharging to municipal mains shall be accomplished in accordance with one of the following options: 1. A tracer wire shall be installed in accordance with all of the following:

a. Exterior access locations shall include a means of protecting the tracer wire.

b. In−ground sleeves may be installed as provided in SPS 384.35 (5) (a) 4. c. and d.

c. both a or b

d. none of the above

174. A means to locate buried non−metallic sewers and private interceptor main sewers discharging to municipal mains shall be accomplished in accordance with one of the following options: 1. A tracer wire shall be installed in accordance with all of the following:

a. Tracer wire conductivity shall be tested prior to use.

b. Conductive warning tape may not be utilized in lieu of tracer wire.

c. both a or b

d. none of the above

175. Tracer wire insulation color for metallic storm pipe shall be brown.

a. true

b. false

176. Tracer wire insulation color for metallic, potable water pipe shall be blue.

a. true

b. false

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(12) PRIVATE INTERCEPTOR MAIN SEWERS. (a) The connection of a private interceptor main sewer to a public sewer shall be in accordance with the conditions of approval for the public sewer granted by the department of natural resources under s. 281.41, Stats.

(b) Private interceptor main sewers which discharge to a municipal treatment facility shall be designed in accordance with the appropriate water quality management plan.

(c) All private interceptor main sewers shall be tested in accordance with SPS 382.21.

(d) Private interceptor main sewers 6" or less in diameter shall be installed in accordance with the criteria for building sewers specified in sub. (11) (b) and (c) and (d) and (e).

(e) Private interceptor main sewers 8" or larger in diameter shall be:

1. Provided with frost protection in accordance with sub. (11) (c); and

2. Installed in accordance with the municipal sewer criteria specified in s. NR 110.13.

(f) No private interceptor main sewer may pass through or under a building to serve another building, unless one of the following conditions are met:

1. The private interceptor main sewer serves farm buildings, farm houses, or both which are located on one property.

2. The private interceptor main sewer serves buildings that are located on one property and a document, which indicates the piping and distribution arrangement for the property and buildings, shall be recorded with the register of deeds no later than 90 days after installation.

177. No private interceptor main sewer may pass through or under a building to serve another building, unless one of the following conditions are met:

a. The private interceptor main sewer serves farm buildings, farm houses, or both which are located on separate properties.

b. The private interceptor main sewer serves buildings that are located on separate properties and a document, which indicates the piping and distribution arrangement for the property and buildings, shall be recorded with the register of deeds no later than 180 days after installation.

c. both a or b

d. none of the above

178. The connection of a private interceptor main sewer to a public sewer shall be in accordance with the conditions of approval for the public sewer granted by the _____.

a. local sanitary district

b. DNR

c. municipality

d. all of the above

179. All private interceptor main sewers shall be tested in accordance with _____.

a. local testing requirements

b. SPS 382.21

c. both a or b

d. none of the above

180. Private interceptor main sewers ___ or less in diameter shall be installed in accordance with the criteria for building sewers specified in sub. (11) (b) and (c) and (d) and (e).

a. 4

b. 6

c. 8

d. 10

Exterior Plumbing Quiz Part 1

1	a	b	c	d	41	a	b	c	d	81	a	b	c	d
2	a	b	c	d	42	a	b	c	d	82	a	b	c	d
3	a	b	c	d	43	a	b	c	d	83	a	b	c	d
4	a	b	c	d	44	a	b	c	d	84	a	b	c	d
5	a	b	c	d	45	a	b	c	d	85	a	b	c	d
6	a	b	c	d	46	a	b	c	d	86	a	b	c	d
7	a	b	c	d	47	a	b	c	d	87	a	b	c	d
8	a	b	c	d	48	a	b	c	d	88	a	b	c	d
9	a	b	c	d	49	a	b	c	d	89	a	b	c	d
10	a	b	c	d	50	a	b	c	d	90	a	b	c	d
11	a	b	c	d	51	a	b	c	d	91	a	b	c	d
12	a	b	c	d	52	a	b	c	d	92	a	b	c	d
13	a	b	c	d	53	a	b	c	d	93	a	b	c	d
14	a	b	c	d	54	a	b	c	d	94	a	b	c	d
15	a	b	c	d	55	a	b	c	d	95	a	b	c	d
16	a	b	c	d	56	a	b	c	d	96	a	b	c	d
17	a	b	c	d	57	a	b	c	d	97	a	b	c	d
18	a	b	c	d	58	a	b	c	d	98	a	b	c	d
19	a	b	c	d	59	a	b	c	d	99	a	b	c	d
20	a	b	c	d	60	a	b	c	d	100	a	b	c	d
21	a	b	c	d	61	a	b	c	d	101	a	b	c	d
22	a	b	c	d	62	a	b	c	d	102	a	b	c	d
23	a	b	c	d	63	a	b	c	d	103	a	b	c	d
24	a	b	c	d	64	a	b	c	d	104	a	b	c	d
25	a	b	c	d	65	a	b	c	d	105	a	b	c	d
26	a	b	c	d	66	a	b	c	d	106	a	b	c	d
27	a	b	c	d	67	a	b	c	d	107	a	b	c	d
28	a	b	c	d	68	a	b	c	d	108	a	b	c	d
29	a	b	c	d	69	a	b	c	d	109	a	b	c	d
30	a	b	c	d	70	a	b	c	d	110	a	b	c	d
31	a	b	c	d	71	a	b	c	d	111	a	b	c	d
32	a	b	c	d	72	a	b	c	d	112	a	b	c	d
33	a	b	c	d	73	a	b	c	d	113	a	b	c	d
34	a	b	c	d	74	a	b	c	d	114	a	b	c	d
35	a	b	c	d	75	a	b	c	d	115	a	b	c	d
36	a	b	c	d	76	a	b	c	d	116	a	b	c	d
37	a	b	c	d	77	a	b	c	d	117	a	b	c	d
38	a	b	c	d	78	a	b	c	d	118	a	b	c	d
39	a	b	c	d	79	a	b	c	d	119	a	b	c	d
40	a	b	c	d	80	a	b	c	d	120	a	b	c	d

Exterior Plumbing Quiz Part 1

121	a	b	c	d	141	a	b	c	d	161	a	b	c	d
122	a	b	c	d	142	a	b	c	d	162	a	b	c	d
123	a	b	c	d	143	a	b	c	d	163	a	b	c	d
124	a	b	c	d	144	a	b	c	d	164	a	b	c	d
125	a	b	c	d	145	a	b	c	d	165	a	b	c	d
126	a	b	c	d	146	a	b	c	d	166	a	b	c	d
127	a	b	c	d	147	a	b	c	d	167	a	b	c	d
128	a	b	c	d	148	a	b	c	d	168	a	b	c	d
129	a	b	c	d	149	a	b	c	d	169	a	b	c	d
130	a	b	c	d	150	a	b	c	d	170	a	b	c	d
131	a	b	c	d	151	a	b	c	d	171	a	b	c	d
132	a	b	c	d	152	a	b	c	d	172	a	b	c	d
133	a	b	c	d	153	a	b	c	d	173	a	b	c	d
134	a	b	c	d	154	a	b	c	d	174	a	b	c	d
135	a	b	c	d	155	a	b	c	d	175	a	b	c	d
136	a	b	c	d	156	a	b	c	d	176	a	b	c	d
137	a	b	c	d	157	a	b	c	d	177	a	b	c	d
138	a	b	c	d	158	a	b	c	d	178	a	b	c	d
139	a	b	c	d	159	a	b	c	d	179	a	b	c	d
140	a	b	c	d	160	a	b	c	d	180	a	b	c	d

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List each credential held by attendee_____

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