



## CONTINUING EDUCATION FOR WISCONSIN PLUMBERS

### PLUMBING PRINCIPLES AND REQUIREMENTS Course #961674

4 CE Hours

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*This course is approved for Master Plumber, Master Plumber Restricted Appliance, Master Plumber Restricted Service, Journeyman Plumber, Journeyman Plumber Restricted Appliance, Journeyman Plumber Restricted Service, Commercial Plumbing Inspector, Utility Contractor, Cross Connection Control Tester, UDC Plumbing Inspector.*

# PLUMBING PRINCIPLES AND REQUIREMENTS

*The purpose of this course is to provide information about the WI plumbing codes for buildings and facilities in the state. These codes were created to ensure that plumbing in these buildings will be safe, sanitary, and designed to safeguard the public health and the waters of the state.*

## **BASIC PLUMBING PRINCIPLES**

This information 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 needed to protect the health of people are the same.



1. Plumbing in connection with all buildings (public and private) intended for human occupancy must be installed and maintained in a way that protects the health, safety and welfare of the public or occupants, and the waters of the state.
2. Plumbing fixtures, appliances and appurtenances (either existing or going to be installed) must be supplied with a sufficient volume and pressure of water to allow them to function properly and efficiently at all times. It must also allow them to function without unnecessary noise under normal conditions of use.
  - a. Plumbing systems should be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning.
3. Devices for heating and storing water in pressure vessels or tanks should be designed and installed to prevent dangers of explosion or overheating.
4. Drain systems should be designed, constructed and maintained to conduct the wastewater or sewage efficiently and should have adequate cleanouts.
5. The drain systems should be designed to provide an adequate circulation of air in all pipes and with no danger of siphonage, aspiration, or forcing of trap seals under conditions of ordinary use.
6. A plumbing system should be of durable material, free from defective workmanship, and designed and constructed to provide satisfactory service for its reasonable expected life.
7. Proper protection should be provided to prevent contamination of food, water, sterile goods, and similar materials by backflow of wastewater.
8. All plumbing fixtures should be installed to provide adequate spacing and accessibility for the intended use and cleaning.

## **PART 1 EXAM QUESTIONS**

1. Plumbing in connection with all buildings intended for human occupancy must be installed in a way that protects \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
  - a. Performance, organization, and success
  - b. Health, safety and welfare of the public
  - c. Spacing, accessibility, and adequacy
  - d. All of the above
2. Plumbing fixtures must be supplied with a sufficient \_\_\_\_\_ and pressure of water to allow them to function properly.
  - a. Volume
  - b. Quality
  - c. Type
  - d. Aspiration

## PART 1 EXAM QUESTIONS (CONTINUED)

3. True or false? Plumbing systems should be designed to use the maximum quantity of water consistent with proper performance.

- True
- False

4. Devices for heating water in pressure vessels should be installed to prevent dangers of \_\_\_\_\_.

- Explosion
- Overheating
- Both a and b
- None of the above

5. The drain systems should provide adequate circulation of air in all pipes and with no danger of \_\_\_\_\_.

- siphonage
- aspiration
- forcing of trap seals
- All of the above

6. True or false? Plumbing fixtures should be installed to provide adequate accessibility for cleaning.

- True
- False

### Basic Plumbing Requirements

- Every building intended for human occupancy should be provided with an adequate, safe, and potable water supply.
- To fulfill the basic needs of sanitation and personal hygiene, each dwelling connected to a POWTS or public sewer should be provided with at least the following plumbing fixtures:
  - one water closet
  - one wash basin
  - one kitchen sink
  - one bathtub or shower (except a system or device recognized under chapter SPS 391 may be substituted for the water closet)



All other structures for human occupancy should be equipped with sanitary facilities in sufficient numbers as specified in chapters SPS 361 to 366.

- Hot or tempered water should be supplied to all plumbing fixtures that normally require hot or tempered water for proper use and function.
- Where plumbing fixtures exist in a building that is not connected to a public sewer system, suitable provision should be made for treating, recycling, dispersing or holding the wastewater.
- Plumbing fixtures should be made of durable, smooth, non-absorbent and corrosion resistant material, and should be free from concealed fouling surfaces.

## PART 1 EXAM QUESTIONS

7. Every building intended for human occupancy should be provided with a \_\_\_\_\_ water supply.

- Adequate
- Potable
- Safe
- All of the above

8. Which of the following plumbing fixtures should each dwelling connected to a POWTS or public sewer be provided with?

- Kitchen sink
- Fountain
- Septic tank
- Bidet

## PART 1 EXAM QUESTIONS (CONTINUED)

9. What should be done for plumbing fixtures not connected to a public sewer system?

- Provisions should be made to treat the wastewater
- Provisions should be made to disperse the wastewater
- Provisions should be made to hold the wastewater
- Any of the above

10. True or false? Plumbing fixtures may have concealed fouling surfaces.

- True
- False

### Administration and Enforcement

#### Plan Review

- Plans and specifications should be submitted to the department or to an approved agent municipality for review in accordance with the following:
  - Department review.* Plumbing plans and specifications for the types of plumbing installations (except direct replacements) listed in Table 1 should be submitted to the department for review, regardless of where the installation is to be located. A municipality should be designated as an agent municipality. Written approval for the plumbing plans should be obtained prior to installation of the plumbing.
  - Department or agent municipality review.* Plumbing plans and specifications for the types of plumbing installations (except direct replacements) listed in Table 2 should 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 should be designated as an agent municipality. Written approval for the plumbing plans should be obtained prior to installation of the plumbing. Review and approval of plumbing plans for 1 and 2 family dwellings should be in accordance with the provisions specified in SPS 320.09.

**TABLE 1**  
**SUBMITTALS TO DEPARTMENT**

<b>1</b>	All plumbing, new installations, additions and alterations, regardless of the number of plumbing fixtures involved, serving hospitals, nursing homes, ambulatory surgery centers, renal dialysis centers, CBRF, and inpatient hospice.
<b>2</b>	Plumbing, new installations, additions and alterations involving 16 or more plumbing fixtures, serving buildings owned by a metropolitan or sanitary sewer district
<b>3</b>	Plumbing, new installations, additions and alterations involving 16 or more plumbing fixtures, serving buildings owned by the state
<b>4</b>	Alternate and experimental plumbing systems
<b>5</b>	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
<b>6</b>	Storm water and clear water infiltration plumbing systems serving a public building or facility
<b>7</b>	Treatment systems, other than POWTS, designed to treat water for compliance with Table 1

**TABLE 2**  
**SUBMITTALS TO DEPARTMENT OR AGENT MUNICIPALITY**

<b>1</b>	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
<b>2</b>	Grease interceptors to be installed for public buildings
<b>3</b>	Garage catch basins, carwash interceptors and oil interceptors to be installed for public buildings and facilities
<b>4</b>	Sanitary dump stations
<b>5</b>	Piping designed to serve as private water mains
<b>6</b>	Water supply systems and drain systems to be installed for manufactured home communities and campgrounds
<b>7</b>	Piping designed to serve as private interceptor main sewers greater than 4 inches in diameter when sized for gravity flow
<b>8</b>	Chemical waste systems regardless of the number of plumbing fixtures
<b>9</b>	Storm water systems, not including infiltration plumbing systems, serving a public building or facility where the drainage area is one acre or more
<b>10</b>	Mixed wastewater holding device

## PART 1 EXAM QUESTIONS

*For the following questions decide if the plan should be submitted to the department only, or if it can be submitted to the department OR agent municipality.*

11. Plumbing installations for hospitals.
  - a. Department
  - b. Department OR agent municipality
12. Experimental plumbing systems.
  - a. Department
  - b. Department OR agent municipality
13. Water supply systems for manufactured home communities.
  - a. Department
  - b. Department OR agent municipality
14. Sanitary dump stations.
  - a. Department
  - b. Department OR agent municipality
15. Plumbing alterations involving 16 or more plumbing fixtures serving buildings owned by the state.
  - a. Department
  - b. Department OR agent municipality
16. Grease interceptors to be installed for public buildings.
  - a. Department
  - b. Department OR agent municipality
17. Pressure vacuum breaker assemblies serving health care facilities.
  - a. Department
  - b. Department OR agent municipality
18. Chemical waste systems regardless of the number of plumbing fixtures.
  - a. Department
  - b. Department OR agent municipality
19. Piping designed to serve as private water mains.
  - a. Department
  - b. Department OR agent municipality
20. Storm water and clear water infiltration plumbing systems serving a public building.
  - a. Department
  - b. Department OR agent municipality

### ***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 should be registered with the department no later than 7 days after installation of the assembly.



### ***Agent Municipalities***

The department can designate to an approved municipality the authority to review and approve plumbing plans and specifications for plumbing installations that will be located within the municipality's boundary limits and that require approval.

An agent municipality should utilize a plumbing inspector qualified by the department to conduct plumbing inspections and plan review at a staffing level based on local need.

- The primary duties of the plumbing inspectors should include plumbing plan review.
- The plumbing inspectors should be Wisconsin licensed master or journeyman plumbers.

**Note:** An agent municipality may waive its jurisdiction for plan review and approval for any project, in which case plans should be submitted to the department for review and approval. Agent municipalities may set by ordinance the fees for plan review services.

## **PART 1 EXAM QUESTIONS**

21. A spill resistant vacuum breaker should be registered with the department no later than how many days after it is installed?

- a. 5 days
- b. 6 days
- c. 7 days
- d. 10 days

22. True or false? A reduced pressure principle back-flow preventer does not need to be registered with the department after installation.

- a. True
- b. False

23. Who should an agent municipality utilize to review and approve plumbing plans?

- a. Agent municipality staff
- b. A master plumber
- c. A journeyman plumber
- d. A plumbing inspector qualified by the department

24. If an agent municipality has waived its jurisdiction for plan review, who should plans then be submitted to?

- a. The Department
- b. Another agent municipality
- c. Any qualified plumbing inspector
- d. None of the above

25. True or false? Agent municipalities may not set fees for plan review services.

- a. True
- b. False

### ***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 specified fee should be submitted to the department. The plans should comply with all of the provisions of the following section.

#### ***Plans and Specifications.***

1. At least 2 sets of plans and one copy of specifications which are clear, legible, and permanent copies should be submitted for examination and approval.
2. All plans submitted for approval should be accompanied by sufficient data and information for the department to determine if the installation and its performance will meet the requirements of chapters SPS 381 to 384.
3. Information to accompany the plans should include the location or address of the installation and the name of the owner.
4. Plans proposing the installation, creation or extension of a sanitary private interceptor main sewer which is to discharge to a municipal treatment facility should do the following:
  - 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 chapter NR 121
  - The plans will not be approved if the municipality is ineligible for sanitary sewer extension approvals under section NR 110.05.
5. Plans proposing the installation of a building sewer for new construction which is to discharge to a municipal treatment facility should do the following:
  - Be accompanied by a letter from either the appropriate designated management agency or sanitary district indicating conformance with an approved area-wide water quality management plan
  - The plan will not be approved if the municipality is ineligible for sanitary sewer extension approvals under section NR 110.05.



### ***Plan Review***

The department should review and make a determination on an application for plan review within 15 business days.

#### ***Conditional Approval***

If, upon review, the department determines that the plans substantially conform to the provisions of chapters SPS 382 to 384, a conditional approval, in writing, should be granted. All non-code complying conditions stated in the conditional approval should be corrected before or during installation.

#### ***Denial of Approval***

If, upon review, the department determines that the plans do not substantially conform to the provisions of chapters SPS 382 to 384, the request of conditional approval should be denied in writing.

#### ***Evidence of Approval***

The plumber responsible for the installation of the plumbing should 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 should be open to inspection by an authorized representative of the department.

***Revisions***

All changes or modifications, which involve the provisions of chapters SPS 382 to 384, made to plumbing plans and specifications, which have been granted approval, should be submitted to the department or agent municipality for examination. All changes and modifications should be approved in writing by the department or agent municipality prior to installation of the plumbing.

***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.

**PART 1 EXAM QUESTIONS**

26. **How many sets of plans should be submitted for examination for non-experimental systems?**

- 1
- 2
- 3
- 4

27. **Plans submitted for approval must meet the requirements of Wisconsin's Administrative Code of Safety and Professional Services (SPS) chapters \_\_\_\_\_ to \_\_\_\_\_.**

- 385 to 390
- 100 to 104
- 320 to 330
- 381 to 384

28. **True or false? The location of the plumbing installation should be included with the submitted plan information.**

- True
- False

29. **The department should make a determination on an application for plan review within how many business days?**

- 5
- 10
- 15
- 20

30. **A conditional approval means which of the following?**

- The department determined that the plans do not substantially conform to the provisions of chapters SPS 382 to 384.
- The department determined that the plans substantially conform to the provisions of chapters SPS 382 to 384. Any non-code complying conditions should be corrected before or during installation.
- The department revoked the approval.
- The department is still considering approval and needs an extended period to make a final decision.

31. **How many sets of plans bearing the department or the agent municipality's stamp of approval should the plumber responsible for the installation keep at the construction site?**

- At least 3
- At least 2
- At least 1
- It is not necessary to keep plans on site

32. **True or false? Revisions to approved plans involving the provisions of chapters SPS 382 to 384 do not need to be submitted to the department or agent municipality for examination.**

- True
- False

33. **The department can revoke a plan approval for which of the following reasons?**

- False statements in the plan upon which the approval was based.
- Misrepresentation of facts in the plan upon which the approval was based.
- Both a and b
- None of the above

### ***Cross Connection Control Registration***

Registration should be submitted in a format acceptable to the department. The form for registering cross connection control devices and assemblies with the department should include at least all of the following information:

- The building or facility name and address where the device or assembly is or will be installed.
- The location of the cross connection control device or assembly within the building or facility.
- A description of the cross connection control device or assembly including the size, model number, serial number and manufacturer.
- The name of the owner or owner's agent submitting the registration form and contact information.

Each registration form submitted should be accompanied by the appropriate fee. Upon receipt of a completed registration form, the department should issue written confirmation of registration including a department assigned identification number for each cross connection control device or assembly.

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 should notify the department in writing using a format acceptable to the department.

## **PART 1 EXAM QUESTIONS**

34. The form for registering cross connection control devices and assemblies with the department should include which of the following:

- a. The location of the cross connection control device or assembly within the building or facility.
- b. The name of the owner or owner's agent submitting the registration form and contact information.
- c. The building or facility name and address where the device or assembly is or will be installed.
- d. All of the above

35. True or false? The department should issue a written confirmation of registration of a cross connection control.

- a. True
- b. False

36. True or false? It is not necessary to notify the department of the removal of a reduced pressure fire protection principle backflow preventer.

- a. True
- b. False

### ***Penalties***

Penalties for violations of chapter SPS 382 should be assessed in accordance with s.145.12, Stats.



Any person who engages in, follows the business or occupation of, advertises or holds himself or herself out as, or acts temporarily or otherwise as a master plumber without first having secured the required license or certificate will be fined not less than \$100, but not more than \$500, or imprisoned for 30 days or both. Each day such violation continues will be a separate offense.

Any person violating or failing to obey a lawful order of the department, or a judgment or decree of a court may be imprisoned for not more than 3 months or fined not more than \$500.

Any master plumber who should employ an apprentice on plumbing representing the apprentice to be a journeyman, or who should charge for an apprentice a journeyman's wage, should be punished by a fine of not more than \$25, or by imprisonment in the county jail for not more than 30 days. Each day of violation should be a separate offense.

Any person who violates a special ruling should forfeit not less than \$10 nor more than \$1,000 for each violation. Each violation of an order or a rule or standard constitutes a separate offense and each day of continued violation is a separate offense.

In lieu of any other penalty, the department may directly assess a forfeiture by issuing an order against any person who is in violation. The department may not assess a forfeiture exceeding \$2,000 for each violation.

The department should promulgate rules specifying the procedures governing the assessment of forfeitures under this subsection including the following:

1. The procedure for issuing an order for an alleged violation.
2. The amount of a forfeiture that the department may assess for an alleged violation
3. The procedure for contesting an order issued for an alleged violation.
4. The procedure for contesting the assessment of a forfeiture for an alleged violation.

The department should remit all forfeitures paid under this subsection to the secretary of administration for deposit in the school fund.

All forfeitures that are not paid as required under this subsection should accrue interest at the rate of 12 percent per year.

The attorney general may bring an action in the name of the state to collect any forfeiture imposed, or interest accrued, under this subsection if the forfeiture or interest has not been paid after the exhaustion of all administrative and judicial reviews.

## PART 1 EXAM QUESTIONS

37. Penalties for violations of chapter SPS 382 should be assessed in accordance with Wisconsin's Administrative Code of Safety and Professional Services (SPS) chapter \_\_\_\_\_.  
 a. 145.12  
 b. 383  
 c. 102.1  
 d. 88.9

38. A person acting as a master plumber without a license may face a maximum fine of what amount?  
 a. \$100  
 b. \$200  
 c. \$250  
 d. \$500

39. True or false? Each day a person advertises him or herself as a master plumber without a license is considered a separate violation.  
 a. True  
 b. False

40. A master plumber who represents an apprentice as a journeyman plumber should be punished by a maximum fine of \$ \_\_\_\_\_ for each day the violation continues.  
 a. \$100  
 b. \$50  
 c. \$25  
 d. \$400

41. What is the minimum amount a person who violates a special ruling may forfeit?  
 a. \$1,000  
 b. \$100  
 c. \$50  
 d. \$10

## PART 1 EXAM QUESTIONS (CONTINUED)

<p>42. What fund should the department deposit all forfeitures into?</p> <ol style="list-style-type: none"> <li>a. State legislature's fund</li> <li>b. School fund</li> <li>c. OSHA fund</li> <li>d. Any of the above</li> </ol>	<p>43. All forfeitures that are not paid as required should accrue interest at what rate?</p> <ol style="list-style-type: none"> <li>a. 15 percent per year</li> <li>b. 10 percent per year</li> <li>c. 12 percent per year</li> <li>d. 5 percent per year</li> </ol>
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### **TESTING AND INSPECTION**

#### **Testing of Plumbing Systems**

All new plumbing and all parts of existing systems which have been altered, extended or repaired should be tested as specified as described below to disclose leaks and defects before the plumbing is put into operation.

##### ***Waiver of testing.***

1. The testing of the plumbing should not be required where the installation does not include the addition, replacement, alteration or relocation of any water distribution, drain or vent piping.
2. Field testing the installation of a storm building sewer and a storm private interceptor main sewer is not required\*.

\* The joints and connections to be employed for storm building sewer piping should conform to SPS 384.40 (1) (a).

##### ***Local inspection.***

Where the plumbing is installed in a municipality having a local inspector, the testing of the plumbing should be done in the presence of a plumbing inspector.

'Notice of inspection': The plumber responsible for the installation should notify the plumbing inspector in person, by telephone, or in writing when the work is ready for inspection.

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.

Testing may be done without the presence of the inspector if 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.

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

'Rough-in inspection.' A rough-in inspection should be made when the plumbing system is roughed-in and before fixtures are set. Plumbing work should 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.

'Final inspection.' Upon completion of the plumbing installation and before final approval is given, the plumbing inspector should inspect the work. Municipalities may require that a final test be conducted and that the final test, when required by the municipality, should be observed by the plumbing inspector.

'Reinspections.' Whenever the plumbing official finds that the work or installation does not pass any initial test or inspection, the necessary corrections should be made. The work or installation should then be resubmitted for inspection to the plumbing inspector.

***Inspection of one-and 2-family dwellings.***

The inspection of plumbing installations for one- and 2-family dwellings should be in accordance with ss. SPS 320.08 to 320.11. The initial testing of cross connection control assemblies should comply with s. SPS 382.22 (8).

**PART 1 EXAM QUESTIONS**

**44. Why should all new plumbing be tested?**

- Disclose leaks
- Disclose defects
- Both a and b
- None of the above

**45. Testing is not required where the installation does not include which of the following?**

- Addition of water distribution piping
- Alteration of drain piping
- Relocation of vent piping
- Any of the above

**46. True or false? Field testing of a storm building sewer is required.**

- True
- False

**47. The plumber may proceed with testing and installation if the inspector has not made the inspection by the end of the following normal \_\_\_\_\_.**

- Business day
- Business week
- Weekend
- Month

**48. For the inspection, the plumber should have which of the following available?**

- Proper apparatus for making the tests.
- Proper appliances for making the tests.
- Him- herself to furnish such assistance as may be necessary.
- All of the above

**49. The inspection of plumbing installations for one-and 2-family dwellings should be in accordance with. SPS chapters \_\_\_\_\_ to \_\_\_\_\_.**

- 382 to 384
- 140.12 to 140.15
- 320.08 to 320.11
- 450 to 475

**Testing Provisions*****General.***

The testing of plumbing installations should be conducted in accordance with this section. 'Equipment, material and labor for tests.' All equipment, material and labor required for testing a plumbing system or part thereof should be furnished by the plumber responsible for the installation.

'Exposure of work.' All new, altered, extended or replaced plumbing should be left uncovered and unconcealed until it has been tested. Where the work has been covered or concealed before it is tested, it should be exposed for testing.

***Sanitary building sewer and sanitary private interceptor main sewer.***

A sanitary building sewer and a sanitary private interceptor main sewer should be tested for leaks and defects with water or air before or after being covered. The test for leaks and defects may be applied to the entire building sewer or private interceptor main sewer or in sections. The testing of a building sewer or private interceptor main sewer is not required to include the manholes serving the sewer.

The building sewer or private interceptor main sewer should be tested by insertion of a test plug at the point of connection with the public sewer. The sewer should 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 should not drop for at least 15 minutes.

The air test should 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 should be held without introduction of additional air for a period of at least 15 minutes.

#### ***Building drain.***

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

#### ***Drain and vent systems.***

The piping of a drain and vent systems, including conductors, should be tested upon completion of the rough piping installation with water or air.

#### ***Private water mains and water services.***

Private water mains and water services should be inspected before being covered. The private water mains and water services should 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 should be obtained from a potable source of supply.

#### ***Water distribution system.***

The piping of a water distribution system should 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 should be obtained from a potable source of supply.

#### ***Test methods for drain and vent systems.***

A test for water-tightness should be applied to the entire drain and vent system at one time or to the entire system in sections after the rough piping has been installed.

If applied to the entire system, all openings in the piping should be tightly closed, except the highest opening, and the system should be filled with water to the point of overflow. If the system is tested in sections, each opening should be tightly plugged except the highest opening of the section under test, and each section should be filled with water, but a section should not be tested with less than a 10 foot head of water. In testing successive sections, at least the upper 10 feet of the next preceding section should be tested, so that no joint or pipe in the building, except the uppermost 10 feet of the system, is subjected to a test of less than a 10 foot head of water. The water should be kept in the system or in the portion under test for at least 15 minutes before inspection starts. The system should then be tight at all points.

The air test should 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 5 pounds per square inch or sufficient to balance a column of mercury 10" in height. This pressure should be held without introduction of additional air for a period of at least 15 minutes.

#### ***Final test.***

Where required by the local plumbing inspector, after the plumbing fixtures have been installed and the traps filled with water, the connections should be tested and proved gas and watertight.

The smoke test should be made by introducing a pungent, thick smoke, produced by one or more smoke machines, into the completed system. When the smoke appears at stack openings on the roof, the openings

should be closed and a pressure equivalent to a one inch water column should be built and maintained for the period of the inspection.

The air test should be made by attaching a gauge to any suitable opening and, after closing all other inlets and outlets in the system, adding air into the system until a pressure equivalent to a one inch water column exists. The pressure should remain constant for at least a 5–minute test period without the introduction of additional air.

## PART 1 EXAM QUESTIONS

50. True or false? All new, altered, extended or replaced plumbing should be left uncovered and unconcealed until it has been tested.

- True
- False

51. The building sewer or private interceptor main sewer should be tested by insertion of a test plug at the point of connection with the public sewer. The sewer should then be filled with water under a head of not less than \_\_\_\_\_ feet.

- 5
- 10
- 15
- 20

52. The piping of a drain and vent systems, including conductors, should be tested upon completion of the rough piping installation with \_\_\_\_\_.

- Water
- Air
- Either a or b
- None of the above

53. When testing for water-tightness, the water should be kept in the system or in the portion under test for at least \_\_\_\_\_ minutes before inspection starts.

- 5
- 10
- 15
- 20

54. What type of smoke should be used during a smoke test?

- Pungent, thick smoke
- Clear, odorless smoke
- Thin, wispy smoke
- Any of the above

55. When conducting an air test, air should be added into the system until a pressure equivalent to a \_\_\_\_\_ inch water column exists.

- Two
- One
- Four
- Three

### Maintenance and Repairs

#### General

All plumbing systems, both existing and new, and all parts thereof, should be maintained in a safe and sanitary condition. All devices or safeguards that are required by this section should be maintained in good working order. The owner should maintain plumbing systems.

#### Existing Systems

Any existing plumbing system may remain and maintenance may continue if the maintenance is in accordance with the original system design and any of the following:

- The plumbing system was installed in accordance with the code in effect at the time of installation.
- The plumbing system conforms to the present code.

When a hazard to life, health or property exists or is created by an existing system, that system should be repaired or replaced.

**Note:** A cross connection is considered a health hazard by the department.

Existing sewers and water services may only be connected to new buildings when determined by examination and test to conform to the requirements of this section.

#### ***Fixtures Replaced***

When a fixture, appliance or section of pipe is replaced, the replacement fixture, appliance or pipe should conform to the provisions of this section.

Where the existing drain or vent piping does not conform to the current provisions of this section, the department may require the new fixtures to be provided with deep seal traps.

#### ***Plumbing Reused***

1. Plumbing materials, fixtures or devices removed and found to be in good condition may be reused if such reuse is approved by the department or a local plumbing inspector.
2. The owner of the building or facility in which the reused materials are to be installed should provide written consent.

Water supply piping materials may only be reused when the intended use involves an equal or higher degree of hazard than the previous use.

#### ***Repairs***

All repairs to fixtures, devices or piping should be completed in conformance with the provisions of this section, except repair clamps or bands may be used for emergency situations.

#### ***Demolition of Structures***

When a structure is demolished or removed, all sanitary sewer, storm sewer and water supply connections should be sealed and plugged in a safe manner.

#### ***Dead Ends***

If a dead end is created in the removal of any part of a drain system, all openings in the drain system should be properly sealed.

#### ***Testing of Cross Connection Control Assemblies***

The performance testing requirements of this subsection apply to all cross connection control assemblies regardless of date of installation.

1. A performance test should be conducted for the assemblies listed in Table 382.22-1 (below) at all of the following intervals:
  - At the time of installation.
  - Immediately after repairs or alterations to the assembly have occurred.
  - At least annually.

The performance test should be conducted using the appropriate test standard for the assembly as specified in Table 382.22-1 (below).

A cross connection assembly performance test should be conducted by an individual registered by the department.

- a. The results of the cross connection control assembly performance test should be submitted as specified in Table 382.22-1 (below) in a format prescribed by the department accompanied by a filing fee.
- b. As specified in Table 382.22-1 (below), the results of the cross connection assembly performance test should be submitted to the department and purveyor within 60 days of completion of the test.

The results of performance tests for the assemblies listed in Table 382.22-1 (below) should be made available upon request to the department, its agent or the local government unit.

**TABLE 382.22-1**  
**TESTING AND SUBMITTING REQUIREMENTS**  
**FOR CROSS CONNECTION CONTROL ASSEMBLIES**

ASSE STANDARD NAME AND NUMBER	CAN/CSA STANDARD NAME AND NUMBER	ASSE TEST STANDARD NUMBER AND TEST REQUIRED	TEST RESULTS TO BE SUBMITTED TO DEPARTMENT
Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies ASSE 1015	Double Check Valve Backflow Preventers CAN/CSA B64.5 and Double Check Valve Backflow Preventers For Fire Protection Systems CAN/CSA-B64.5.1	5015	No
Double Check Detector Fire Protection Backflow Prevention Assemblies ASSE 1048	N/A	5048	No
Pressure Vacuum Breaker Assembly ASSE 1020	Pressure Vacuum Breakers CAN/CSA-B64.1.2	5020	Yes
Reduced Pressure Principle Backflow Preventers and Reduced Pressure Fire Protection Principle Backflow Preventers ASSE 1013	Reduced Pressure Principle Backflow Preventers CAN/CSA B64.4 and Reduced Pressure Principle Backflow Preventers For Fire Protection Systems CAN/CSA-B64.4.1	5013	Yes
Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies ASSE 1047	N/A	5047	Yes
Spill Resistant Vacuum Breaker ASSE 1056	Spill Resistant Vacuum Breakers CAN/CSA B64.1.3	5056	Yes

## PART 1 EXAM QUESTIONS

**56. Who is responsible for maintaining plumbing systems?**

- a. The responsible plumber
- b. The agent municipality
- c. The department
- d. The owner

**57. True or false? A cross connection is considered a health hazard by the department.**

- a. True
- b. False

**58. Water supply piping materials may only be reused when the intended use involves a \_\_\_\_\_ degree of hazard than the previous use.**

- a. Lower
- b. Equal or lower
- c. Equal or higher
- d. None of the above

**59. Should results from a double check backflow prevention assemblies test be submitted to the department?**

- a. Yes
- b. No
- c. Maybe
- d. Depends on the location of the assembly

**60. Should results from a spill resistant vacuum breaker test be submitted to the department?**

- a. Yes
- b. No
- c. Maybe
- d. Depends on the location of the assembly