

## CHAPTER 94

# CROSS CONNECTION AND BACKFLOW PREVENTION

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**94.01 DEFINITIONS.** The definitions below shall apply only to this chapter. The definitions below shall take precedence over definitions given in any other chapter.

1. “Administrative Authority” means the City of Boone Building and Zoning Department for the purposes of this chapter.
2. “Approved Backflow Prevention Assembly for Containment” means a backflow prevention assembly having met the requirements of ANSI-AWWA Standard C510-89, “Double Check Valve Backflow Prevention Assemblies”, or ANSI-AWWA Standard C511-89, “Reduced Pressure Principle Backflow Prevention Assemblies”. In addition to meeting the standards stated above, the back flow prevention assembly shall include the limitations of use based on the degree of hazard as well as be listed by the International Association of Plumbing and Mechanical Officials.
3. “Auxiliary Water Supply” means any water supply on or available to the premises other than the water purveyor's approved public water supply. Examples include but are not limited to a private well, river, reservoir, and pond.
4. “Backflow” means the flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.
5. “Building Official” means the Director of the City of Boone Building and Zoning Department or any duly authorized assistant, agent or representative.
6. “Containment” means a method of backflow prevention which requires installing a backflow prevention assembly at the water service entrance to isolate the entire system downstream of the water service connection.
7. “Contaminant” means a substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or the spread of disease.
8. “Cross Connection” means any actual or potential connection between the public potable water supply and a possible source of contamination or pollution.

9. "Customer" means the owner, operator, or occupant of a building or property which has a water service from a public potable water system or owners of private water systems that receive their water from public potable water systems.
10. "Degree of Hazard" means the rank of a cross connection's potentiality to harm the public potable water system. The rank is usually whether the cross connection has the capability to cause either contamination or pollution; contamination synonymous with high hazard and pollution synonymous with low hazard.
11. "Department" means the City of Boone Building and Zoning Department.
12. "Double Check Valve Backflow Prevention Assembly" means an assembly of two (2) independently operating spring loaded check valves with tightly closing shut off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.
13. "High Hazard Cross Connection" means a cross connection with the potentiality to cause an impairment of the water quality which would generate a risk to public health. Examples include but are not limited to industrial chemicals, wastewater, etc.
14. "Isolation" means a method of backflow prevention in which a backflow prevention device is located to correct a cross connection at an in-plant location rather than at a water service entrance.
15. "Low Hazard Cross Connection" means a cross connection with the potentiality to cause an impairment of the water quality which would not generate a risk to public health but would adversely affect the aesthetic qualities of the water.
16. "Permit" means a document issued by the Department which allows the use of a backflow prevention assembly.
17. "Pollutant" means a foreign substance, that if permitted to get into the public potable water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably effect such water for domestic use.
18. "Reduced Pressure Principle Backflow Prevention Assembly" means an assembly consisting of two (2) independently operating approved check valves with an automatically operating differential relief valve located between the two (2) check valves, tightly closing shut off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and relief valve.
19. "Registered Backflow Prevention Assembly Technician" means a person who is trained to test and repair backflow prevention assemblies as well

as report on the conditions of back flow prevention assemblies. The technician must be registered by the State of Iowa.

20. “Thermal Expansion” means volumetric increase of water due to heating resulting in increased pressure in a closed system.

21. “Water Service” means the connection between the public potable water system and a customer's property or building. The water service connection is the point in the public potable water system beyond the sanitary control of the Department.

**94.02 PURPOSE.** This chapter is intended to accomplish the following:

1. Protect the public potable water supply served by the Department from the possibility of contamination or pollution by isolating, within its customers internal distribution system, such contaminants or pollutants which could backflow or back-siphon into the public potable water system.
2. Promote the elimination or control of existing cross connections, actual or potential, between its customers in-plant potable water system, and non-potable systems.
3. Provide for the maintenance of a continuing program of cross-connection control which will effectively prevent the contamination or pollution of all potable water systems by cross-connection.

**94.03 ADMINISTRATIVE AUTHORITY.** The following authorities shall be recognized:

1. The Federal Safe Drinking Water Act of 1974 and the statutes of the Iowa Administrative Code. The water purveyor has the primary responsibility for preventing water from unapproved sources, or any other substances, from entering the public potable water system.
2. The City of Boone, Rules, Regulations, and Ordinances adopted.
3. The Department shall have the right to enter any property to inspect for possible cross connections. To enter any property, the Department must have either the consent of the customer or a warrant from a court of appropriate jurisdiction.
4. The Department shall maintain records of the following:
  - A. Cross Connection Hazard Surveys
  - B. Cross Connection Permits and Permit Applications
  - C. Cross Connection Inspections, Installations, Testing, and Repairs

**94.04 RESPONSIBILITY.** The responsibilities for the Department and customer are the following:

1. The Department shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the back flow of contaminants or pollutants through the water service connection. If, in the judgment of the Building Official, an approved backflow device is required at the City's water service connection to any customer's premises, the Building Official or his delegated agent shall give notice in writing to said customer to install an approved back flow prevention device at each service connection to his premises. The customer shall, within ninety (90) days install such approved device, or devices, at his own expense, and failure to install said device or devices within 90 days shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.
2. The customer shall be responsible for the elimination or protection of all cross connections on his/her premises. The customer shall also inform the Department of any cross connection of which the customer is aware but has not been found by the Department.
3. The customer shall, at his or her own expense, install, maintain, and test, or have tested, all backflow prevention assemblies on his/her premises.
4. The customer shall ensure that all records from any installation, testing, or repairs of a backflow prevention assembly are submitted to the Department within fifteen (15) days of the installation, test, or repair.
5. The customer shall immediately notify the Department if any backflow does occur as well as proceed to isolate the contamination or pollution.
6. The customer shall install only backflow prevention assemblies approved by the Department.
7. The customer shall be responsible for the payment of all fees for permits, testing, re-testing if necessary, inspections, and re-inspections if necessary.

**94.05 ADMINISTRATION.** The provisions of this section shall be administered according to the following:

1. For new water services:
  - A. The Department shall establish the degree of hazard for a particular entity from review of submitted plans and site visits.
  - B. The Department shall determine the type of backflow prevention assembly required for the new water service based on the degree of hazard from (A) above. Also See 94.06 below.
  - C. Before the water service is turned on for use, the Department shall inspect the installation of the backflow prevention assembly and the backflow prevention assembly must be tested by a registered backflow prevention assembly technician.

2. For existing water services:
  - A. If a water service is to be upgraded after adoption of this ordinance, the upgraded water service shall be treated as a new water service.
  - B. The Department shall publish the standards they will use to determine the degree of hazard within three (3) months after adoption of this ordinance.
  - C. The Department shall determine the classification of each dwelling in the City. Within three (3) months after publication of these standards, those customers whose premises are classified as single family residential will not be required to complete a cross connection survey and will not be contacted by the Department. Within three (3) months after publication of these standards, those customers whose premises are not classified as single family residential will be required to complete a cross connection survey and will be contacted by the Department. The Department may also perform on premise investigations for those premises that are not classified as single family residential. The Department will use the information from the cross connection surveys and on premise investigations to determine the degree of hazard associated with each water service.
  - D. The Department shall determine the type of backflow prevention assembly from the degree of hazard determined in (C) above.
  - E. The Department shall notify the customer of which type of backflow prevention assembly is required for their water service. After notification by the Department, the customer shall install the required backflow prevention assembly within ninety (90) days. The Department reserves the right to reduce the 90 day time frame if they deem necessary depending on the degree of hazard.
  - F. If during an on-premise investigation the Department determines that there is a high hazard cross connection, the Department reserves the right to terminate the water service until an approved backflow prevention assembly has been installed and tested. The Department has the authority to determine a schedule of compliance for the customer.
  - G. Customers shall not be relieved of their responsibility to eliminate cross connections if they are not contacted by the Department. Customers are required to conform to all the requirements of this ordinance after its adoption even if they are not instructed to do so.

**94.06 REQUIRED BACKFLOW PREVENTION ASSEMBLIES.** The type of backflow prevention assembly required shall be selected according to the following:

1. For water services:
  - A. For those cross connections which the Department has classified as high hazard, a minimum of an air gap or an approved reduced pressure principle backflow assembly is required.
  - B. For those cross connections which the Department has classified as low hazard, a minimum of an approved double check valve assembly is required.
2. For fire protection systems:
  - A. A reduced pressure principle back flow prevention assembly shall be installed if the Department finds at least one of the following:
    - (1) Direct connections from public water mains to an auxiliary water supply for a pump connection.
    - (2) Direct connections from public water mains to an auxiliary water supply.
    - (3) The customer using antifreezes or other additives.
    - (4) Combined industrial and fire protection systems supplied from public water mains.
    - (5) Connections between a public water main and any other facility that may cause contamination.
  - B. A double check valve assembly will be required for all other fire protection systems, new or existing.

#### **94.07 BACKFLOW PREVENTION ASSEMBLY TECHNICIANS.**

Requirements for backflow prevention assembly technicians include the following:

1. The Technician must be registered in the State of Iowa to perform testing and repairs.
2. The Technician's registration number shall be on all forms associated with this chapter.
3. Improper testing, improper repair, improper reporting of results, or any other unethical practice shall be grounds of reporting said individual to the State.

#### **94.08 INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES.**

General and specific requirements for the installation of backflow prevention assemblies are shown below:

1. General requirements for the installation of backflow prevention assemblies include the following:
  - A. Installed in horizontal plumbing.
  - B. Installed immediately following the water meter.

- C. Installed upstream of branch piping.
  - D. Installed to be protected from freezing.
  - E. Installed to be protected from thermal expansion if hot water is used within the water system.
  - F. Installed not to create a safety hazard (e.g. above an electrical panel).
  - G. Installed to be accessible for testing.
  - H. Installed to the specifications of the manufacturer for all check valves, shut off valves, pressure relief valves, etc.
  - I. Installed with two backflow prevention assemblies in parallel piping if interruption of water service is unacceptable.
  - J. Installed as to the Department's instructions.
2. Specific requirements for the installation of reduced pressure principle backflow prevention assemblies include the following:
- A. They shall be protected from flooding.
  - B. They shall be discharged to an appropriate drain.
  - C. They shall not be installed in underground vaults.

**94.09 TESTING OF BACKFLOW PREVENTION ASSEMBLIES.** General instructions for the testing of backflow prevention assemblies are shown below:

- 1. The test must be performed by a registered backflow prevention assembly technician.
- 2. The costs of all testing shall be paid by the customer.
- 3. The backflow prevention assemblies shall be tested and inspected according to the following:
  - A. A backflow prevention device must be tested immediately following installation.
  - B. A backflow prevention device must be tested at least once per year.
  - C. A backflow prevention device, if it is out of operation for more than three (3) months, must be tested before it is put back into operation.
  - D. A backflow prevention assembly, if it fails a test, must be repaired or replaced and then retested.
  - E. A backflow prevention device, if a water service is terminated for any reason, must be tested before the water service is continued.

- F. A backflow prevention assembly must be tested any time the Department requires that a test be done.
4. The registered back flow prevention assembly technician must report the results of each test to the customer and the Department within fifteen (15) days after the test was completed. The Department will only accept results reported on the provided form.

**94.10 REPAIR OF BACKFLOW PREVENTION ASSEMBLIES.** Any repairs or modifications of back flow prevention assemblies shall be according to the following:

1. The Department will only accept repairs that are done by registered backflow prevention assembly technicians.
2. The registered backflow prevention assembly technician shall only use original manufacturer replacement parts for repairs and shall not change the technical aspects of the backflow prevention assembly including the design, materials, and operational characteristics.
3. The registered backflow prevention assembly technician must report the repairs done on a backflow prevention assembly to the customer and the Department within fifteen (15) days after the repair was completed. The technician must also report the results of the testing of the repaired backflow prevention assembly to the customer and the Department in the same time period. The technician must document the repair. The documentation shall include replacement parts used.
4. The fire marshal shall be notified by the registered back flow prevention assembly technician if a backflow prevention assembly used for a fire protection service is going to be repaired or tested. The registered back flow prevention assembly technician must estimate the time it will take for such repairs or testing and report the estimated time to the fire marshal.

**94.11 EXISTING BACKFLOW PREVENTION ASSEMBLIES.** Any existing backflow prevention assembly shall be allowed by the Department to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present back flow prevention assembly, or result in an unreasonable risk to the public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow prevention assembly must be upgraded to a reduced pressure principle device, or a reduced pressure principle device must be installed in the event that no backflow prevention assembly was present.

**94.12 CUSTOMER NON-COMPLIANCE.** The water service may be discontinued in the case of non-compliance with this ordinance. Non-compliance includes, but is not limited to, refusal to allow the Department access to property to inspect cross connections, removal of a required backflow prevention assembly, failure to install a required backflow prevention assembly, and failure to properly test or properly repair a backflow prevention assembly when warranted.

**94.13 PERMITS.** The Department shall not permit a cross connection within the public water supply system unless it is considered necessary and that it cannot be eliminated. Permits for cross connections that cannot be eliminated shall be obtained and renewed according to the following:

1. Cross connection permits are required for each backflow prevention assembly. The cross connection permits can be obtained from the Department.
2. Permits shall be renewed every three (3) years and are non-transferable. Permits are subject to revocation and become immediately revoked if the customer should so change the type of cross connection or degree of hazard associated with the service.

**94.14 RECORDS AND REPORTS.** The Department will initiate and maintain the following:

1. The Department will initiate and maintain the files on cross connection permits.
2. Copies of permits and permit applications.
3. Files on customer cross connection tests and/or inspections.

**94.15 FEES AND CHARGES.** Fees will be set by resolution of the City Council based on the recommendations of the building official. The Department will then publish a list of fees or charges for the following services or permits:

1. Fee for re-inspection of premises.
2. Permit Fee.
3. Renewal of Permit Fee.
4. Charges for after-hours inspections or tests.

*(Ch. 94 – Ord. 2128 – Feb. 08 Supp.)*

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