

# ARTICLE D. CROSS CONNECTION CONTROL

## 13-1D-1: PURPOSE:

The purpose of this article is to safeguard potable water supplies by preventing backflow into public water systems. (2007 Code § 44-205)

## 13-1D-2: DEFINITIONS:

For the purpose of this article, these definitions supersede definitions given elsewhere in this code:

**AIR GAP WATER DISTRIBUTION:** The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying potable water to the flood level rim of any tank, vat, or fixture.

**APPROVED BACKFLOW PREVENTION ASSEMBLY FOR CONTAINMENT:** A backflow prevention assembly which is listed by the University of Southern California Foundation for Cross Connection Control And Hydraulic Research as 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" for containment. The listing shall include the limitations of use based on the degree of hazard. The backflow prevention assembly must also be listed by the International Association of Plumbing and Mechanical Officials.

**APPROVED BACKFLOW PREVENTION ASSEMBLY FOR CONTAINMENT IN A FIRE PROTECTION SYSTEM:** A backflow prevention assembly to be used in a fire protection system which meets the requirements of Factory Mutual Research Corporation (FM) or Underwriters Laboratories (UL), and the requirement of the fire code and the building code of the city of Dubuque, in addition to the requirements of subsection [13-1D-7B](#) of this article. Devices sized smaller than two and one-half inches (2 $\frac{1}{2}$ ) diameter, which have not been listed by Underwriters Laboratories (UL) or by Factory Mutual Research Corporation (FM) may be allowed if approved by the administrative authority.

**AUXILIARY WATER SUPPLY:** Any water supply on or available to the premises other than the water purveyor's approved public water supply, such as, but not limited to, a private well, pond, or river.

**CONTAINMENT:** A method of backflow prevention which requires the installation of a backflow prevention assembly at the water service entrance.

**CONTAMINATION:** An impairment of the quality of the potable water which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids or waste. Also defined as "high hazard".

**CROSS CONNECTION:** Any actual or potential connection or arrangement, physical or otherwise, between a potable water supply system and any plumbing fixture or tank, receptacle, equipment, or device, through which it may be possible for nonpotable, used, unclean, polluted, and contaminated water, or other substance, to enter into any part of such potable water system under any condition.

**CUSTOMER:** The owner, operator, or occupant of a building or property which has a water service from a public water system, or the owner or operator of a private water system which has a water service from a public water system.

**DEGREE OF HAZARD:** The rating of a cross connection or water service which indicates if it has the potential to cause contamination or pollution.

**DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY:** A backflow prevention device consisting of two (2) independently acting internally loaded check valves, four (4) properly located test cocks, and two (2) isolation valves.

**HIGH HAZARD CROSS CONNECTION:** A cross connection which may cause an impairment of the quality of the potable water by creating an actual hazard to the public health, through poisoning or through the spread of disease by sewage, industrial fluids, or waste.

**ISOLATION:** A method of backflow prevention in which a backflow prevention assembly is located at the cross connection rather than at the water service entrance.

**LOW HAZARD CROSS CONNECTION:** A cross connection which may cause an impairment of the quality of potable water to a degree which does not create a hazard to the public health, but which does adversely and unreasonably affect the aesthetic qualities of such potable waters for domestic use.

**POLLUTION:** An impairment of the quality of the potable water to a degree which does not create hazard to the public health but which does adversely and unreasonably affect the aesthetic qualities of such potable water for domestic use.

**POTABLE WATER:** Water which is satisfactory for drinking, culinary, and domestic purposes and meets the requirements of the health authority having jurisdiction.

**PUBLIC WATER SYSTEM:** Public owned or operated system consisting of source facilities and distribution system under the complete control of the administrative authority. Regulative control shall include any and all distribution piping connected to said system.

**REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY:** A backflow prevention device consisting of two (2) independently acting internally loaded check valves, a different pressure relief valve, four (4) properly located test cocks, and two (2) isolation valves.

**REGISTERED BACKFLOW PREVENTION ASSEMBLY TECHNICIAN:** A person who is registered with the Iowa state health department to test or repair backflow prevention assemblies and report on the condition of those assemblies.

**THERMAL EXPANSION:** Volumetric increase of water due to heating resulting in increased pressure in a closed system.

**WATER SERVICE:** Depending on the context, water service is the physical connection between a public water system and a customer's building, property, or private water system, or the act of providing potable water to a customer. (2007 Code § 44-206)

### **13-1D-3: CITY MANAGER'S AUTHORITY:**

- A. Right Of Entry For Inspection: The city manager shall have the right to enter any property to inspect for possible cross connections.
- B. Collect Fees: The city manager may collect fees for the administration of this program. Said fees shall be set by the city manager.
- C. Maintain Records: The city manager shall maintain records of cross connection hazard surveys, and the installation, testing, and repair of all backflow prevention assemblies installed for containment purposes. (2007 Code § 44-207)

### **13-1D-4: NEW WATER SERVICES:**

- A. Submission Of Plans: Plans shall be submitted to the city manager for review on all new water services in order to determine the degree of hazard.
- B. Type Of Assembly Required: The city manager shall determine the type of backflow prevention assembly required for containment based on the degree of hazard.
- C. Installation Requirement: The city manager shall require the installation of the appropriate backflow prevention assembly for containment before the initiation of water service. (2007 Code § 44-208.1)

## **13-1D-5: EXISTING WATER SERVICES:**

- A. Upgrades Of Existing Services: Upgrades of existing water services shall be treated as new water services for the purposes of this article.
- B. Provide Copy Of Standards: The city manager shall publish and make available to each customer a copy of the standards used to determine the degree of hazard.
- C. Notify Customers Of Classification: After publication of the standards, the city manager shall, in writing, notify customers whose premises are classified as commercial and/or industrial of the provisions of this article and shall require compliance therewith.
- D. Customers Provide Hazard Survey: Within six (6) months after receipt of the notification in subsection C of this section, customers whose premises are classified as commercial and/or industrial shall complete and return to the city manager a cross connection hazard survey to be used to determine the type of containment device.
- E. Failure To Provide Survey: A customer who fails to complete and return the cross connection survey form required by subsection D of this section to the city manager within the designated time frame shall be subject to the penalties set forth in section [13-1D-10](#) of this article.
- F. Determine Type Of Assembly Required: The city manager shall, on the basis of information received from customers or gathered through on premises investigations or surveys, determine the type of backflow prevention assembly required for containment based on the degree of hazard.
- G. Time Limit For Installation: Within the time frame specified in writing by the city manager, the customer shall install a backflow prevention assembly for containment required by the city manager.
- H. Actions Upon High Hazard Determination: For existing water services, the city manager may inspect the premises to determine the degree of hazard. When high hazard cross connections are found, the city manager shall, at its sole discretion:
  - 1. Develop a schedule of compliance which the customer shall follow; or
  - 2. Terminate the water service until a backflow prevention assembly for containment required by the city manager has been installed.

I. Compliance By Customer Required: Failure of the city manager to notify a customer that the customer is believed to have a high hazard cross connection and that the customer shall install backflow prevention assemblies for containment in no way relieves the customer of the responsibility to comply with all requirements of this article. (2007 Code § 44-208.2)

### **13-1D-6: CUSTOMER RESPONSIBILITIES:**

- A. Ensure Nonexistence Of Cross Connections: The customer shall be responsible for ensuring that no cross connections exist without approved backflow protection within the customer's premises starting at the point of service from the public potable water system.
- B. Installation, Testing And Maintenance: The customer shall, at the customer's own expense, cause installation, operation, testing and maintenance of the backflow prevention assembly required by the city manager.
- C. Provide City With Copies Of Records: The customer shall ensure the city manager is provided with copies of records of the installation of all tests and repairs made to the backflow prevention assembly on the approved form within fifteen (15) days after testing and/or repairs are completed.
- D. Notify City Of Backflow Incidents; Remedial Action: In the event of a backflow incident, the customer shall immediately notify the city manager of the incident and take immediate action to confine the contamination or pollution. (2007 Code § 44-209)

### **13-1D-7: REQUIRED BACKFLOW PREVENTION ASSEMBLIES:**

#### **A. Water Services:**

1. An air gap or an approved reduced pressure principle backflow prevention assembly is required for water service that has been determined by the city manager to be high hazard.
2. An approved double check valve assembly is required for water service that has been determined by the city manager to be low hazard. (2007 Code § 44-210.1)

**B. Fire Protection Systems:**

1. A reduced pressure principle backflow prevention assembly shall be installed on all new and existing fire protection systems which the administrative authority determines to have any of the following:
  - a. Direct connections from public water mains with an auxiliary water supply on or available to the premises for pumper connections;
  - b. Interconnections with auxiliary supplies such as reservoirs, rivers, ponds, wells, mills, or other industrial water systems;
  - c. Use of antifreeze or other additives in the fire protection system;
  - d. Combined industrial or domestic with high hazard and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks; or
  - e. Any other facility, connection, or condition which may cause contamination.
2. A double check valve assembly shall be required for all other fire protection systems. The double check valve shall be required on all new systems at the time of installation and on existing systems at the time that they are upgraded. (2007 Code § 44-210.2)

**C. Backflow Prevention Assembly Technician:**

1. Registration: A backflow prevention assembly technician registered by the state shall include such technician's registration number on all correspondence and forms required by or associated with this article. (2007 Code § 44-210.3)
2. Noncompliance By Technician:
  - a. The registration of a technician shall be recommended for revocation or suspension for a period of up to two (2) years for noncompliance with this article. Further action shall be taken as prescribed by law to prevent further noncompliance.
  - b. Any of the following conditions shall constitute noncompliance:
    - (1) Improper testing or repair of backflow prevention assemblies;
    - (2) Improper reporting of the results of testing or of repairs made to backflow prevention assemblies;
    - (3) Failure to meet registration requirements; or
    - (4) Related unethical practices. (2007 Code § 44-210.4)

#### **D. Installation Of Backflow Prevention Assemblies:**

1. Installation; Location: The required backflow prevention assemblies for containment shall be installed in horizontal plumbing immediately following the meter or as close to that location as deemed practical by the administrative authority. In any case, it shall be located upstream from any branch piping. Installation at this point does not eliminate the responsibility of the customer to protect the water supply system from containment or pollution between the backflow prevention assembly and the water main.
2. Protection From Flooding: Reduced pressure principle backflow prevention assemblies shall be installed so as to be protected from flooding.
3. Underground Vaults Or Pits: Reduced pressure principle backflow prevention assemblies shall not be installed in underground vaults or pits.
4. Protection From Freezing: All backflow prevention assemblies shall be protected to prevent freezing. Those devices used for seasonal services may be removed in lieu of being protected from freezing; however, the devices must be reinstalled and tested by a registered backflow prevention assembly technician prior to service being reactivated.
5. Hot Water; Thermal Expansion Required: If hot water is used within the water system, thermal expansion shall be provided for when installing a backflow prevention assembly for containment.
6. Discharge To Suitable Drain: Provisions shall be made to convey the discharge of water from reduced pressure principle backflow prevention assemblies to a suitable drain.
7. Safety Hazard Prohibited: No backflow prevention assemblies shall be installed in a place where it would create a safety hazard, such as, but not limited to, over an electrical panel, or above ceiling level.
8. Interruption Of Water Service: If interruption of water service during testing and repair of backflow prevention assemblies for containment is unacceptable to the customer, another backflow prevention assembly, sized to handle the temporary water flow need during the time of test or repair, should be installed in parallel piping. All such installations shall be at the customer's expense.
9. Accessibility For Testing: All backflow prevention assemblies shall be installed so that they are accessible for testing as stated in this article.
10. Shutoff Valves: All shutoff valves shall conform to the current edition of the "Manual Of Cross Connection Control" (University of Southern California) requirements for either ball or resilient seat gate valves at the time of installation. Ball valves shall be used on assemblies installed in piping two inches (2") and smaller and resilient gate valves on assemblies installed in piping larger than two inches (2"). (2007 Code § 44-210.5)

#### **E. Testing Of Backflow Prevention Assemblies:**

1. Testing of backflow prevention assemblies shall be performed by a registered backflow prevention assembly technician. The costs of tests required in the following subsections E2 through E5 of this section shall be borne by the customer.
2. Backflow prevention assemblies shall be tested upon installation and tested and inspected at least annually.
3. Backflow prevention assemblies which are in place, but have been out of operation for more than three (3) months, shall be tested before being put back into operation. Backflow prevention assemblies used in seasonal applications shall be tested before being put into operation each season.
4. Any backflow prevention assembly which fails a periodic test shall be repaired or replaced. When water service has been terminated for noncompliance, the backflow prevention assembly shall be repaired or replaced prior to the resumption of water service. Backflow prevention assemblies shall be retested by a registered backflow prevention assembly technician immediately after repair or replacement.
5. The city manager may require backflow prevention assemblies to be tested at any time in addition to the annual testing requirement.
6. The registered backflow prevention assembly technician shall report the successful test of a backflow prevention assembly to the customer and to the city manager on the form provided by the city manager within fifteen (15) days of the test.
7. The city manager may require, at its own cost, additional tests of individual backflow prevention assemblies as it shall deem necessary to verify test procedures and results. (2007 Code § 44-210.6)

#### **F. Repair Of Backflow Prevention Assemblies:**

1. All repairs to backflow prevention assemblies shall be performed by registered backflow prevention assembly technicians.
2. The registered backflow prevention assembly technician shall not change the design, material, or operational characteristics of a backflow prevention assembly during repair or maintenance, and shall use only original manufacturer replacement parts.
3. The registered backflow prevention assembly technician shall report the repair of a backflow prevention assembly to the customer and to the city manager on the form provided by the city manager within fifteen (15) days of the repair. The report shall include the list of materials or replacement parts used. (2007 Code § 44-210.7)

### **13-1D-8: CUSTOMER NONCOMPLIANCE:**

The water service may be discontinued in the case of noncompliance with this article, including the following:

- A. Refusal to allow the city manager access to the property to inspect for cross connections;
- B. Removal of a backflow prevention assembly which has been required by the city manager;
- C. Bypassing of a backflow prevention assembly which has been required by the city manager;
- D. Providing inadequate backflow prevention when cross connections exist;
- E. Failure to install a backflow prevention assembly which has been required by the city manager;
- F. Failure to test and/or properly repair a backflow prevention assembly as required by the city manager; or
- G. Failure to comply with the requirements of this article. (2007 Code § 44-211)

### **13-1D-9: FEES:**

The city manager is hereby directed to establish a permit fee for new installations and a fee for annual inspections of backflow prevention devices, which fee shall be fair and reasonable considering the current cost of material and labor. The minimum permit and inspection fee shall be twenty five dollars (\$25.00). (2007 Code § 44-212)

### **13-1D-10: PENALTY:**

- A. It shall be unlawful for any person, firm or corporation to repair, move, improve, remove, convert or demolish, equip, use, occupy or maintain any building or structure or cause or permit the same to be done in violation of this article.
- B. The doing of any act, or the omission of any act, declared to be unlawful by this article, or any code or division herein adopted by reference shall be deemed a separate offense for each and every day or portion thereof during which any such unlawful act is omitted, continued or permitted and, upon conviction, shall be punishable as provided in [title 1, chapter 4](#) of this code. The penalty herein provided

shall be cumulative with and in addition to the revocation, cancellation or forfeiture of any license or permit elsewhere in this code provided for violation thereof. (2007 Code § 44-213)

### **13-1D-11: SEPARABILITY OF PROVISIONS:**

It is the intention that each section, paragraph, sentence, clause, and provision of this article is separable, and if any provision is held unconstitutional or invalid for any reason, such decision shall not affect the remainder of this article nor any part thereof other than that affected by such decision. (2007 Code § 44-214)