12.33 - CROSS-CONNECTION CONTROL.

(a) **Purpose.** The purpose is to safeguard potable water supplies by preventing backflow into public water systems.

(b) **Definitions.** The following definitions shall apply to Section 12.33 of the Cedar Rapids Municipal Code and to the Uniform Plumbing Code as adopted by the City which, as amended by the City, serves as the Cedar Rapids Plumbing Code. For the purpose of this section, these definitions supersede definitions given elsewhere in this code.

1. Air-Gap Water Distribution. An air-gap water distribution is 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.

2. 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.

3. 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 Laboratory (UL), and the requirement of the Fire Code and the Building Code of the City of Cedar Rapids, in addition to the requirements of paragraph 1(a). Devices sized smaller than 2½″ diameter, which have not been listed by Underwriters Laboratory (UL) or by Factory Mutual Research Corporation (FM) may be allowed if approved by the administrative authority.

4. 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.

5. Containment. A method of backflow prevention which requires the installation of a backflow-prevention assembly at the water service entrance.

6. 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."

7. 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.

8. 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.

9. Degree of Hazard. The rating of a cross-connection or water service which indicates if it has the potential to cause contamination or pollution.

10. Double Check Valve Backflow-Prevention Assembly. A backflow-prevention device consisting of two independently acting internally loaded check valves, four properly located test cocks, and two isolation valves.

11. High Hazard Cross Connection. A high hazard cross-connection is 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.

12. 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.

13. Low Hazard Cross Connection. A low hazard cross-connection is 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 pubic health, but which does adversely and unreasonably affect the aesthetic qualities of such potable waters for domestic use.

14. Pollution. An impairment of the quality of the 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. Also defined as "low hazard."

15. Potable Water. Potable water is water which is satisfactory for drinking, culinary and domestic purposes and meets the requirements of the health authority having jurisdiction.

16. 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.

17. Reduced-Pressure Principle Backflow Prevention Assembly. A backflow-prevention device consisting of two independently acting internally loaded check valves, a differential pressure relief valve, four properly located test cocks, and two isolation valves.

18. 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.

19. Thermal Expansion. Volumetric increase of water due to heating resulting in increased pressure in a closed system.

20. 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.

(c) **Administrative Authority.**

1. For the purposes of Chapter 12 of the Cedar Rapids Municipal Code and Chapter 6 of the Uniform Plumbing Code (the Cedar Rapids Plumbing Code) only, the administrative authority is the City Council acting through such persons or agencies the City Council shall designate.

2. The administrative authority shall have the right to enter any property to inspect for possible cross-connections.

3. The administrative authority may collect fees for the administration of this program. Said fees shall be set by Cedar Rapids City Council resolution.

4. The administrative authority shall maintain records of cross-connection hazard surveys, and the installation, testing and repair of all backflow-prevention assemblies installed for containment and isolation purposes.

(d) **New Water Services.**

1. Plans shall be submitted to the administrative authority for review on all new water services in order to determine the degree of hazard.

2. The administrative authority shall determine the type of backflow-prevention assembly required for containment based on the degree of hazard.

3. The administrative authority shall require the installation of the appropriate backflow-prevention assembly for containment before the initiation of water service.

(e) **Existing Water Services.**

1. Upgrades of existing water services shall be treated as new water services for the purpose of Chapter 12 of the Cedar Rapids Municipal Code and the Uniform Plumbing Code (the Cedar Rapids Plumbing Code).

2. The administrative authority shall publish and make available to each customer a copy of the standards used to determine the degree of hazard.

3. After publication of the standards, the administrative authority shall, in writing, notify customers whose premises are classified as single family residential of the provisions of this chapter and shall require compliance therewith.

4. Within 6 months after publication of the standards, customers whose premises are not classified as single-family residential shall complete and return to the administrative authority a cross-connection hazard survey to be used to determine the type of containment device.

5. The administrative authority 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.

6. Within the time frame specified in writing by the administrative authority, the customer shall install a backflow-prevention assembly for containment required by the administrative authority.

7. For existing water services, the administrative authority may inspect the premises to determine the degree of hazard. When high hazard cross-connections are found, the administrative authority 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 administrative authority has been installed.

8. Failure of the administrative authority to notify a customer that they are believed to have a high hazard cross-connection and that they shall install backflow-prevention assemblies for containment in no way relieves a customer of the responsibility to comply with all requirements of this section.

(f) **Customer.**

1. The customer shall be responsible for ensuring that no cross-connections exist without approved backflow-protection within his or her premises starting at the point of service from the public potable water system.

2. The customer shall, at his or her own expense, cause installation, operation, testing and maintenance of the backflow-prevention assemblies required by the administrative authority.

3. The customer shall ensure the administrative authority is provided with copies of records of the installation and of all tests and repairs made to the backflow-prevention assembly on the approved form within 15 days after testing and/or repairs are completed.

4. In the event of a backflow incident, the customer shall immediately notify the Cedar Rapids Utilities Department-Water Division and the Cedar Rapids Building Department of the incident and take immediate action to confine the contamination or pollution.

(g) **Required Backflow-Prevention Assemblies for Containment-Water Services.**

1. An air-gap or an approved reduced-pressure principle backflow-prevention assembly is required for water services having one or more cross-connections which the administrative authority classifies as high hazard.

2. An approved double check valve assembly is required for water services having no high hazard cross-connections but having one or more cross-connections which the administrative authority has classified as low hazard.

(h) **Required Backflow-Prevention Assemblies for Containment-Fire Protection Systems.**

1. A reduced-pressure principal 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 connection;

B. Interconnections with auxiliary supplies such as reservoirs, rivers, ponds, wells, mills or other industrial water systems;

C. Use of antifreezes 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;

E. Any other facility, connection or condition which may cause contamination.

2. A double check valve assembly will 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.

(i) **Registration of Backflow-Prevention Assembly Technician.** A backflow-prevention assembly technician registered by the State of Iowa shall include his or her registration number on all correspondence and forms required by or associated with this chapter.

(j) **Registered Backflow-Prevention Assembly Technician Noncompliance.**

1. The registration of a technician will be recommended for revocation or suspension for a period of up to two years for noncompliance with the ordinance codified in this chapter. Further action will be taken as prescribed by law to prevent further noncompliance.

2. Any of the following conditions constitute noncompliance:

A. Improper testing or repair of backflow-prevention assemblies;

B. Improper reporting of the results of testing or of repairs made to backflow-prevention assemblies;

C. Failure to meet registration requirements;

D. Related unethical practices.

(k) **Installation of Backflow-Prevention Assemblies.**

1. 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. Reduced-pressure principle backflow prevention assemblies shall be installed so as to be protected from flooding.

3. Reduced-pressure principle backflow-prevention assemblies shall not be installed in underground vaults or pits.

4. 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. If hot water is used within the water system, thermal expansion shall be provided for when installing a backflow-prevention assembly for containment.

6. Provisions shall be made to convey the discharge of water from reduced pressure principle backflow-prevention assemblies to a suitable drain.

7. 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. 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 installation shall be at the customer's expense.

9. All backflow-prevention assemblies shall be installed so that they are accessible for testing as stated in Chapter 12 of the Cedar Rapids Municipal Code and the Uniform Plumbing Code (the Cedar Rapids Plumbing Code).

10. All shut-off valves shall conform with 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 2 inches and smaller and resilient seat gate valves on assemblies installed in piping larger than 2 inches.

(l) **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 paragraphs (l)2-(l)5 of this subsection 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 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 administrative authority 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 administrative authority on the form provided by the administrative authority within 15 days of the test.

7. The administrative authority may require, at its own cost, additional tests of individual backflow-prevention assemblies as it shall deem necessary to verify test procedures and results.

(m) **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 administrative authority on the form provided by the administrative authority within 15 days of the repair. The report shall include the list of materials or replacement parts used.

(n) **Customer Noncompliance.**

1. The water service may be discontinued in the case of noncompliance with Chapter 12 of the Cedar Rapids Municipal Code and the Uniform Plumbing Code (the Cedar Rapids Plumbing Code). Noncompliance includes, but is not limited to, the following:

A. Refusal to allow the administrative authority access to the property to inspect for cross-connections;

B. Removal of a backflow-prevention assembly which has been required by the administrative authority;

C. Bypassing of a backflow-prevention assembly which has been required by the administrative authority;

D. Providing inadequate backflow prevention when cross-connections exist;

E. Failure to install a backflow-prevention assembly which has been required by the administrative authority;

F. Failure to test and/or properly repair a backflow-prevention assembly as required by the administrative authority;

G. Failure to comply with the requirements of this chapter.

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