

ARTICLE VIII. - CROSS-CONNECTION, BACKFLOW AND BACK-SIPHONAGE CONTROL

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Sec. 23-301. - Intent, purpose and control.

(a) It is the intent of this article to recognize that there are varying degrees of hazard to potable water within the water main and water supply systems. It is also the intent to apply the principle that the degree of protection should be commensurate with the degree of hazard.

(b) The purpose of this article is to:

(1) Protect the public potable water supply of the city against actual or potential cross-connections, backflow, and back-siphonage by isolating within the premises of private property contamination or pollution that has occurred or may occur because of some undiscovered or unauthorized cross-connection on the premises of private property;

(2) Eliminate cross-connections, backflow and back-siphonage of any other source of water or process water used for any purpose whatsoever which may jeopardize the safety of the public potable water supply of the city;

(3) Establish a cross-connection, backflow and back-siphonage control program.

(c) Cross-connection, backflow and back-siphonage control require cooperation between the city and the consumer. The responsibilities and duties of each shall be as set forth in this article and other applicable regulations.

(Code 1959, § 21-56)

Sec. 23-302. - Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Air gap separation means the unobstructed, vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level rim of the receptacle. An approved air gap separation shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel. In no case shall the gap be less than one (1) inch.

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Approved, as used in reference to a water supply system or backflow prevention device or method, means one that has been approved by the state division of health services.

Backflow prevention device means any effective device, method or construction used to prevent backflow into a potable water system. The type of device used shall be based on the degree of hazard, either existing or potential.

Back-pressure backflow means backflow caused by a pump, elevated tank, boiler or other means that could create pressure within the system greater than the supply pressure.

Back-siphonage backflow means a reversal of the normal direction of flow in the pipeline due to a negative pressure (vacuum) being created in the supply line with the backflow source subject to an atmospheric pressure.

Check valve, approved means a check valve that is driptight in the normal direction of flow when the inlet pressure is one (1) p.s.i. and the outlet pressure is zero. The check valve shall permit no leakage in a direction reverse to the normal flow. The closure element (e.g., clapper) shall be internally weighted, or otherwise internally loaded, to promote rapid and positive closure.

Consumer means any person using or receiving water from the city water system.

Contamination means an impairment of the quality of the water by sewage or industrial fluids or waste to a degree which creates an actual hazard to the public health through poisoning or through the spread of disease, or pathogenic organisms.

Cross-connection means any actual or potential connection or structural arrangement between a public or a consumer's potable water system, and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gas or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices and other temporary/permanent devices through which, or because of which, backflow can or may occur are considered to be cross-connections.

Cross-connection, point of means the specific point of location in a public or a consumer's potable water system, where a cross-connection exists.

Detector check valve means a check valve having as an integral part a bypass line and meter for the detection of flow.

Double check valve assembly means an assembly composed of two (2) single, independently acting, approved check valves, including tightly closing shut-off valves located at each end of the assembly and suitable connections for testing the water-tightness of each check valve.

Hazard, degree of shall be derived from the evaluation of a health, system, plumbing or pollutional hazard.

Hazard, health means an actual or potential threat of contamination or pollution of a physical or toxic nature to the public potable water system or the consumer's potable water system to such a degree or intensity that there would be a danger to health.

Hazard, plumbing means a plumbing-type cross-connection in a consumer's potable water system that has not been properly protected by a vacuum breaker, air-gap separation, or other device. Unprotected

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plumbing-type cross-connections are considered to be a health hazard. They include, but are not limited to, cross-connections to toilets, sinks, lavatories, wash trays, domestic washing machines and lawn-sprinkling systems. Plumbing-type cross-connections can be located in any types of structures including homes, apartment houses, hotels and commercial and industrial establishments.

Hazard, pollutional means an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer's potable water system but which would not constitute a health or system hazard. The maximum degree or intensity of pollution to which the potable water system could be degraded under this definition would cause a nuisance, be objectionable or could cause minor damage to the system or its appurtenances.

Hazard, system means an actual or potential threat of severe danger to the physical properties of the public or the consumer's potable water system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.

Industrial fluids means any fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollution or plumbing hazard, if introduced into an approved water supply. This may include, but is not limited to, polluted or contaminated used waters, all types of process waters and used waters originating from the public potable water system which may deteriorate in sanitary quality, chemicals in fluid form, plating acids and alkalies, circulated cooling waters connected to an open cooling tower and/or cooling waters that are chemically or biologically treated or stabilized with toxic substances, contaminated natural waters such as from wells, springs, streams, rivers, irrigation canals or systems, etc.; oils, gases, glycerine, paraffines, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other processes or for firefighting purposes.

Industrial piping system, consumer's means any system used by the consumer for transmission of or to confine or store any fluid, solid or gaseous substance other than an approved water supply. Such a system would include all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey or store substances which are or may be polluted or contaminated.

Pollution means an impairment of the quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably affect such waters for domestic use.

Reduced pressure principle backflow prevention device means a device containing within its structure a minimum of two (2) independently acting, approved check valves, together with an automatically operating pressure differential relief valve located between the two (2) check valves. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow, the pressure between the checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to atmosphere, shall operate to maintain the pressure between the checks less than the supply pressure. The unit shall include tightly closing shut-off valves located at each end of the device and each device shall be fitted with properly located test cocks.

Service connections means the terminal end of a service connection from the public potable water system, i.e., where the city loses jurisdiction and sanitary control over the water at its point of delivery to the consumer's water. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service lines ahead of any meter or backflow prevention device located at the point of delivery to

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the consumer's water system.

Water, potable means water from any source which has been investigated by the health agency having jurisdiction, and which has been approved for human consumption.

Water supply, auxiliary means any water supply on or available to the premises other than the city's approved public potable water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source such as well, spring, river, stream, etc., or used waters or industrial fluids. They may be polluted or contaminated or they may be objectionable and constitute an unacceptable water source over which the city does not have sanitary control.

Water system, consumer's includes any water system located on the consumer's premises whether supplied by a public potable water system or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.

Water system, consumer's potable means that portion of the privately owned potable water system lying between the service connection and the point of use. This system will include all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, store or use potable water.

Water system, public potable means any publicly or privately owned water system operated as a public utility under a valid health permit to supply water for domestic purposes. This system will include all sources, facilities and appurtenances between the source and the service connection such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, treat or store a potable water [supply] for public consumption or use.

Water, used means any water supplied by a water purveyor from a public potable water system to a consumer's water system after it has passed through the service connection and is no longer under the control of the water purveyor.

(Code 1959, § 21-58)

Cross reference— Definitions and rules of construction generally, § 1-2.

Sec. 23-303. - Responsibilities of city, consumer; enforcement.

(a) The city is primarily responsible for the prevention of contamination and pollution of the public water system. Such responsibility begins at the point of origin of the public water distributing system, and ends at the service connection to the consumer's water system. In addition, the city shall exercise reasonable vigilance to ensure that the consumer has taken the proper steps to protect the public potable water system. When it is determined that a backflow prevention device is required for the protection of the public system of the city, the city shall require the consumer, at the consumer's expense, to install an approved backflow prevention device at each service connection.

(b) The consumer has the prime responsibility of preventing contaminants and pollutants from entering his potable water system or the public water system at his service connection. The consumer, at his own expense, shall install, operate and maintain an approved backflow prevention device at the service connection, as directed by the city. Tests, maintenance and repairs of backflow prevention devices shall be made by the consumer at his own expense. A certification of testing and or maintenance shall be submitted annually to the superintendent of the water/sewer maintenance division.

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(c) Enforcement of this article shall be administered by the public works director utilizing the staff of the water/sewer maintenance and inspections division.

(Code 1959, § 21-57; Ord. No. 10-87, 3-2-87)

Sec. 23-304. - Regulations.

(a) No water service connections to any premises shall be installed or maintained unless the potable water and water supply are protected against actual or potential contamination or pollution in the manner required.

(b) In the event of contamination or pollution of a potable water system, the consumer shall notify, immediately, the city in order that appropriate measures may be taken to overcome the contamination or pollution.

(c) The director, or his authorized representative, shall have the right to enter any building, structure or premises to perform any duty imposed upon him by this article where cross-connection, backflow and back-siphonage is deemed possible.

(d) Nothing herein shall relieve the consumer of the responsibility for conducting, or causing to be conducted, periodic surveys of water use practices on his premises to determine whether there are actual or potential cross-connections in the consumer's water system through which contaminants or pollutants could flow back into the public water system.

(e) On request, the consumer shall furnish to the city any pertinent information regarding the water supply system on such property where cross-connection, backflow, and back-siphonage is deemed possible.

(f) Existing situations, requiring the installation of backflow prevention devices shall be considered on a case-by-case basis, but in no case shall the completion date for compliance with the provisions exceed two (2) years from the effective date of this article.

(g) Water service may be discontinued after reasonable notice to the consumer if a violation of this article exists on the premises, and such other precautionary measures may be taken as are deemed necessary to eliminate any danger to the potable water system. Water service shall not be restored until the danger has been eliminated in compliance with the provisions of this article.

(h) Installation of all cross-connections, backflow and back-siphonage control devices will be by the public works department, or by a mechanical contractor or utility contractor approved by the city.

(i) All cross-connection, backflow and back-siphonage control equipment shall meet the testing requirements of the Foundation for Cross-Connection Control and Hydraulic Research, the American Water Works Association, and the state building code, Volume II Plumbing, and the United States Environmental Protection Agency. The following are city-approved backflow control devices: Hersey, Febco, and Neptune-Wilkins.

(j) All cross-connection, backflow and back-siphonage control devices, both existing and new, and all parts thereof, shall be maintained in a safe condition and in good working order. The consumer shall be responsible for the maintenance of all backflow prevention devices. All backflow prevention devices shall be tested at least once a year, or more often in those instances where inspections indicate a need, by the consumer. All rubber goods shall be replaced at least every five (5) years or more often if needed. All maintenance and repairs shall be made at the expense of the consumer.

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(k) All backflow prevention devices located at the service connection shall be tested at least once a year, or more often in those instances where inspections indicate a need, by the department of public works.

(l) All rubber goods shall be replaced every five (5) years, or more often if needed. All maintenance and repairs shall be made at the expense of the consumer.

(Code 1959, § 21-59; Ord. No. 10-87, 3-2-87)

Sec. 23-305. - Industrial plants and facilities.

This section sets out the usual requirements and methods of correction for backflow protection at the service connection. The following abbreviations have been adopted described devices and methods used to control cross-connections at the service connection:

Air gap (A.G.)

Reduced pressure backflow device (R.P.D.)

Double check valve assembly (D.C.A.)

Double detector check valve assembly (D.D.C.A.)

(1) *Auxiliary water systems:*

- a. Potentially contaminated source, A.G. or R.P.D.;
- b. Potable but not acceptable as supplemental source for the public water system, D.C.A.;
- c. Approved source supplemental to the public potable water system, none.

(2) *Beverage bottling plants:*

- a. Subject to backpressure, A.G. or R.P.D.;
- b. Not subject to backpressure, D.C.A.

(3) *Breweries:* A.G. or R.P.D.

(4) *Buildings*—Hotels, apartment houses, public and private buildings or other structures:

- a. Major health hazard exists, A.G. or R.P.D.;
- b. Minor health hazard exists, D.C.A.

(5) *Canneries, packing houses, and reduction plants:* A.G. or R.P.D.

(6) *Chemical plants*—Manufacturing, processing, compounding or treatment: A.G. or R.P.D.

(7) *Chemically contaminated water systems:* A.G. or R.P.D.

(8) *Civil works:*

- a. Health hazard exists, A.G. or R.P.D.;

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- b. No health hazard, D.C.A.
- (9) *Dairies and cold storage plants:*
 - a. Health hazard exists, A.G. or R.P.D.;
 - b. No health hazard, D.C.A.
- (10) *Film laboratory:* A.G. or R.P.D.
- (11) *Fire systems:*
 - a. Health hazard exists, A.G. or R.P.D.;
 - b. No health hazard, D.D.C.A.
- (12) *Hospitals, medical buildings, sanitariums, morgues, mortuaries, autopsy facilities:* A.G. or R.P.D.

Nursing and convalescent homes and clinics (single-story): D.C.A.
- (13) *Irrigation systems:* Premises having irrigation systems separate from their domestic systems such as: parks, playgrounds, cemeteries, golf courses, schools, estates, ranches, etc.: A.G. or R.P.D.
- (14) *Laundries and dye works:* A.G. or R.P.D.
- (15) *Metal manufacturing, cleaning, processing and fabricating plants:*
 - a. Health hazard exists, A.G. or R.P.D.;
 - b. No health hazard, D.C.A.
- (16) *Paper and paper products plants:* A.G. or R.P.D.
- (17) *Plating plants:* A.G. or R.P.D.
- (18) *Power plants:* A.G. or R.P.D.
- (19) *Radioactive materials or substances*—Plants or facilities handling: A.G. or R.P.D.
- (20) *Restricted, classified or other closed facilities:* A.G. or R.P.D.
- (21) *Sand and gravel plants:* A.G. or R.P.D.
- (22) *Schools and colleges:* A.G. or R.P.D.
- (23) *Sewage and storm drain facilities:* A.G. or R.P.D.

(Code 1959, § 21-60)

Sec. 23-306. - Cross-connection with source other than city.

- (a) Where any connection to a city water line is made, and the property owner also maintains a well or

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other source of water, it shall be unlawful for the plumbing serving any building upon such property to be so connected that it be served with water from any source other than the city connection, and it shall also be unlawful to have plumbing cross-connected or so installed that water from the city water system or the private water system may, in any way, become intermingled. Such cross-connections may result in removal of the meter supplying such connections, as well as other penalties, civil or criminal, provided by law. Any and all permits required by the Iredell County plumbing inspector shall be obtained prior to any connections being made.

(b) Upon discovery of a cross-connection upon any property being furnished water through the city water system, the owners of this property shall be notified that the cross-connection must be discontinued immediately. If the correction is not made, the meter shall be removed and shall not be reinstalled until such time a cross-connection is discontinued and payment of a five hundred dollar (\$500.00) charge is received.

(Code 1959, § 21-61; Ord. No. 32-02, 8-5-02)