

CITY OF GRAND JUNCTION, COLORADO

RESOLUTION NO. 89-99

A RESOLUTION OF THE CITY OF GRAND JUNCTION, COLORADO ESTABLISHING A CROSS-CONNECTION CONTROL PROGRAM AND POLICIES TO REQUIRE ADEQUATE BACKFLOW PREVENTION PURSUANT TO 1) SECTIONS 25-1-107, 25-1-108, 25-1-109 AND 25-1-114, C.R.S., AS AMENDED AND 2) COLORADO PRIMARY DRINKING WATER REGULATIONS, ARTICLE 14 HAZARDOUS CROSS CONNECTIONS.

RECITALS:

On October 20, 1965 and on July 18, 1990, the City adopted various technical codes, including but not limited to the 1988 Uniform Plumbing Code, Chapter 10 Water Distribution, Section 1003 Cross-Connection Control. Since that time the City has taken an active role in identifying and eliminating cross connections and the water system contamination that can result from cross connections. Given the importance of this program and that the Council has not comprehensively reviewed the program since 1994.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GRAND JUNCTION THAT:

(I) THE CITY COUNCIL HAVING THE AUTHORITY TO IMPLEMENT AND MAINTAIN, AS OUTLINED AND CONTAINED BELOW, A CROSS-CONNECTION CONTROL PROGRAM, HEREBY ADOPTS THE FOLLOWING:

(a) Authority to implement and maintain this cross-connection control program is contained in, but not limited to, the following:

- (1) 25-1-114, 25-1-114.1, C.R.S. (Colorado Department of Health).
- (2) Colorado Primary Drinking Water Regulations Article 14, (Hazardous Cross-Connections).
- (3) Cross-Connection Control, Colorado Department of Health, October 1, 1993.
- (4) Occupational Safety and Health Administration Federal Register #202 part 2, page 22234, subparts J.
- (5) 1994 edition of the Uniform Building Code or the more recently adopted version.
- (6) 1994 edition of the Uniform Plumbing Code of the International Plumbing and Mechanical Officials or the more recently adopted version.
- (7) 1988 edition of the Uniform Pool and Spa Code or the more recently adopted version.

(b) The following reference manuals shall constitute the City's general guidelines concerning cross-connection control:

(1) Colorado Cross-Connection Control Manual, Colorado Department of Health, Revision October 1995.

(2) "Cross-Connection Control Manual," EPA 570/9-89-007, June 1989.

(c) The following words shall have the meanings set forth:

(1) Air Gap - The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, other device or vessel and the flood level rim of said vessel.

(2) Approved - means accepted by the water purveyor as meeting the applicable specification or procedures as stated or cited in this manual.

(3) Approved Backflow Prevention Device (Assembly) - means a device listed in the latest University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research "List of Approved Backflow Prevention Assemblies."

(4) Auxiliary Water Supply - Any water supply on or available to the premises other than the water purveyor's approved potable water supply. These auxiliary water supplies may include, but are not limited to water from another purveyor's potable water supply or any natural source(s) such as a well, spring, river, stream, pond, lake, etc. or "used waters" or "industrial fluids." These waters may be polluted or contaminated, or may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

(5) Backflow - means the undesirable reversal of, or the possibility thereof, the direction of flow of the water or mixtures of water and other liquid, gases, or other substances into the distribution pipes of the potable water supply from any source or sources caused by back pressure and/or back siphonage.

(6) Backflow Prevention Device or "backflow preventer" - A device or means designed to prevent backflow created by back pressure, back siphonage or back pressure and back siphonage acting together.

(7) Back Pressure - means backflow caused by a pump, elevated tank, boiler, or "head" in pipe, or any means that could create greater pressure within a piping system than that which exists within the potable water supply.

(8) Back siphonage – means the reverse flow of, or potential thereof, water or other liquids, mixtures, gases or substances into the distribution pipes of a potable water supply system caused by negative or sub atmospheric pressure in the potable water supply system.

(9) Certified Cross-Connection Control Technician - means a person who is a Colorado certified Cross-Connection Control Technician with a license issued by the Water Distribution and Waste Water Collection Systems Council.

(10) Check Valve - means a self-closing device which is designed to permit the flow of fluids in only one direction. A single check valve is not an approved backflow prevention device.

(11) Colorado Department of Health Cross-Connection Control Manual - A manual that has been published by the State addressing cross-connection control practices which shall be used as a guidance document for the water purveyor in implementing a Cross-Connection Control Program. The October 1995 revision.

(12) Containment - Protection by containment shall mean the installation of an approved backflow prevention device, or method, on the water service line(s) serving any premises, location, facility or area. Protection by containment shall be used when the potable water system may be contaminated or polluted by substances used or stored within a building or premises.

(13) Contamination - means an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates a potential hazard to the public health through a reduction in water quality or through the spread of disease or hazardous materials.

(14) Critical Level - means the critical level or other regulated "C/L marking" on a backflow prevention device or vacuum breaker which is a point conforming to approved standards and established by testing laboratory, which determines the minimum elevation above the flood-level rim of the fixture, highest point of usage, or receptacle served at which the device may be installed. When a backflow prevention device does not bear a critical level marking, the bottom of the vacuum breaker, combination valve, or the bottom of any such approved device shall constitute the critical level.

(15) Cross-Connection - means any physical arrangement whereby a potable water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, tank, plumbing fixture, or other device which contains, or may contain, contaminated water, sewage, or other waste, liquid or gas of unknown or unsafe quality which may be capable of imparting contamination or pollution to the potable water supply as a result of backflow. Bypass arrangements, jumper connections, removable spools, swivel or changeover devices, four-way valve connections, and other temporary or permanent devices through which, or because of which, backflow could occur are included in the definition of cross-connection.

(16) Cross-Connections, Controlled - A connection made between a potable water system and a non-potable water system with an approved backflow prevention device, properly installed and tested in accordance with this manual, will continuously afford the protection commensurate with the degree of hazard as determined by the Director of Public Works of the City.

(17) Double Check Valve Assembly, ("DC" or "DCVA") - An assembly of two independently operating approved check valves between two tightly closing (resilient seated) shut-off valves, plus four (4) properly located test cocks for the testing of each check valve. The entire assembly shall be an approved backflow prevention device.

(18) Flood-Level Rim - means the edge of the receptacle from which liquid overflows.

(19) Hazard, Degree of - the term is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system as determined by the Director of Public Works of the City.

(20) Hazard, Health - Any condition, device, or practice in the water supply system and its operation which could create, or in the judgment of the water purveyor may create, a danger to the health and well-being of a water consumer. An example of a health hazard is a structural defect, including cross-connections, in a water supply system, or a direct connection of a potable water supply line to a sanitary sewer.

(21) Hazard, Plumbing - A plumbing type cross-connection in a potable water system that has not been properly protected by an air-gap separation or an approved backflow prevention device. Unprotected plumbing type cross-connections are deemed to be a health hazard.

(22) Hazard, Pollution - An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be a threat to life or be dangerous to health as determined by the Director of Public Works of the City.

(23) Hazard, System - An actual or potential threat of severe damage to the physical properties of the potable water system 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 caused by a cross-connection.

(24) Industrial Fluids System - Any system containing a fluid or solution which may be chemically, biologically, radiologically, or otherwise contaminated or polluted in a form or concentration that would constitute a health, system, pollution or plumbing hazard if introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated waters; all types of process waters and "used waters" originated from the potable water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis; circulated cooling waters connected to an open cooling tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, lakes, dams, ponds, retention pits, irrigation canals or system, etc.; oils, gases, glycerin, glycols, paraffins, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other purposes or for fire-fighting purposes.

(25) Isolation - The control of cross-connections within a building's plumbing system by the installation of approved backflow prevention devices or methods at or mean the potential sources of pollution or contamination.

(26) Non-Potable Water - means water that is not safe for human consumption or that does not meet the requirements set forth in the State of Colorado Primary Drinking Water Regulations.

(27) Pollution - means the presence of any foreign substance (organic, inorganic, radiological or biological) in the water that may degrade the water quality so as to constitute a non-health type hazard or impair its usefulness.

(28) Potable Water - means water free from impurities in amounts sufficient to cause disease or harmful physiological effects. The bacteriological, chemical and radiological quality shall conform to State of Colorado Primary Drinking Water Regulations.

(29) Reduced Pressure Principle Device or Reduced Pressure Zone Device "RPZ" - An assembly of two independently operating approved check valves with a hydraulic automatic operating differential relief valve between the two check valves. The assembly shall be located between two (2) tightly closing (resilient seated) shut-off valves and have four (4) properly located test cocks for the testing of the check and relief valves. The entire assembly shall be an approved backflow prevention device.

(30) Submerged Inlet - means a water pipe or extension thereof from a potable water supply terminating below the flood level rim of a tank, vessel, fixture or appliance which may contain water of questionable quality, waste or other contaminant or pollutant.

(31) Vacuum - means any pressure less than atmospheric pressure.

(32) Vacuum Breaker, Atmospheric Non-pressure Type - means a vacuum breaker consisting of an air inlet opening and a non-loaded floating check disk valve designed to prevent back siphonage only. The device shall not be subjected to continuous static line pressure or backpressure or be installed where it would be under pressure for more than twelve (12) continuous hours.

(33) Vacuum Breaker, Pressure Type - means a vacuum breaker, designed to prevent back siphonage only, consisting of a spring-loaded check valve, a spring-loaded air inlet opening, a tightly closing shut off valve on each side of the device and two (2) appropriately located test cocks. The device shall not be subjected to backpressure. The entire assembly shall be an approved backflow prevention device.

(34) Water Distribution and Wastewater Collection Systems Certification Council - means the group, which has been designated by the Colorado Department Health to administer and maintain the Cross-Connection, Control Technician certification program.

(35) Water -Purveyor or "Water Supplier" - means any person or group owning and/or operating a public potable water supply.

(36) Water-Service Connection - means the terminal end of the water purveyor's service connection from the potable water distribution system; i.e., where the water purveyor loses jurisdiction and sanitary control over the water as its point of delivery to the customer's stop box or shut-off valve or meter, which ever comes first from the water main. If a meter is installed at the end of the service connection, the service connection shall mean the downstream end of the meter. There shall be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer's water system. This shall include irrigation systems and fire sprinkler systems. Service connection shall also include water service connection from a hydrant and all other temporary or emergency water service connections from the potable water system. For customers outside the water purveyor limits, "water service connection" shall mean the terminal end of the water purveyor's service connection from the potable water system to the customer's corporation stop.

(d) General Requirements:

(1) All building plans must be submitted to the City of Grand Junction Water Services Division for approval prior to the issuance of water service. Building plans must show:

- a. Water service type, size and location;
- b. Meter size and location;
- c. Backflow prevention device size, type and location; and
- d. Fire sprinkling system(s) service line, size and type of backflow prevention device, if applicable.

(e) Standards for Backflow Prevention Devices:

(1) Any backflow prevention device required herein shall be of a model and size approved by the City of Grand Junction. The term “Approved Backflow Prevention Device” shall mean a device that has been manufactured in full conformance with the standards established by the Colorado Department of Health Cross-Connection Manual and by the City of Grand Junction. The customer shall have 45 days to respond to the City’s request for information on the “Cross-Connection Questionnaire” (Exhibit “A”) and one (1) year from date of notification by the City to come into compliance if a backflow device is required.

(2) Applicability:

- a. No grandfathering exists or shall be asserted. All laws and regulations apply as of the adoption hereof regardless of the age of the water service and/or the age of the building, home, facility or structure.
- b. All fire sprinkler systems shall conform to the National Fire Protection Association (NFPA) pamphlets number thirteen and twenty-four.
  - 1. All fire sprinkling lines shall have a minimum protection of an approved double check valve for containment of the system.
  - 2. Backflow devices used on fire lines shall have O.S. & Y. (outside stem & yoke) valves and be listed by the National Fire Protection Association.
  - 3. All glycol (ethylene or propylene) or anti-freeze fire suppression systems shall have an approved Reduced Pressure Zone Device for containment.
  - 4. Dry fire systems shall have an approved Double Check Valve installed upstream of the air pressure valve.
  - 5. Single family residence with a fire sprinkler system and domestic water combined shall have a double check valve when no chemicals are used.
- c. Only approved backflow prevention devices shall be used. The latest University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR) “Approved Device List” shall constitute the approved backflow devices for use in Grand Junction.

- d. Backflow preventers currently installed that are not approved shall be replaced with an approved device at the time the device fails an operational test specified by the City.

(f) Installations:

- (1) Backflow prevention devices shall be installed in accordance with instructions and approved designs.
- (2) Backflow prevention device installations shall be inspected and approved prior to use by the City of Grand Junction Water Services Division.
- (3) All backflow devices shall be installed in the horizontal position. Devices manufactured and identified for other alignments may be installed if in accordance with the design and FCCCHR approval.
- (4) A vacuum breaker pressure type shall be used where the device is will not be subjected to back pressure and installed a minimum of twelve (12) inches above the highest piping or outlet downstream of the device in a manner to preclude back pressure, but no higher than sixty (60) inches above ground level.
- (5) A vacuum breaker, atmospheric non-pressure type, shall be used only where the device is:
  - a. Never subjected to more than 12 hours continuous pressure; and
  - b. Installed with the air inlet in a level position and a minimum of six (6) inches above the highest piping or outlet it is protecting.
  - c. No valves shall be installed downstream of atmospheric vacuum breaker.
- (6) The single check valve shall not be considered to be a backflow prevention device.
- (7) Double check valve assemblies may be installed in below grade vaults when these vaults are properly constructed, in accordance with approved plans and insulated to prevent freezing.
- (8) A reduced pressure backflow preventer shall be used only if:
  - a. The reduced pressure assembly will not be submerged under water.
    - 1. There is a drain twice the diameter of the assembly to daylight.
    - 2. It is installed in a vertical position unless the device is approved by the FCCCHR for another installation.
    - 3. It is installed a minimum of 12” and a maximum of 36” from the floor.
  - b. Basement installations:
    - 1. A drain large enough to allow the maximum flow of water the size of the reduced pressure backflow preventer is capable of discharging under twice

(2x) the normal static pressure for the system. See flow chart in Colorado Cross Connection Control Manual appendix 3.

2. An acceptable high water alarm system is installed.

- c. There are no electrical components in the general area of the assembly.
- d. Only factory-supplied funnels shall be used to remove the periodic discharge from the assembly and the piping system must have adequate air gate at the termination of the run.
- e. The reduced pressure backflow preventer shall be kept from freezing.
- f. All assemblies installed within a confined area must allow enough room for testing and maintenance.
- g. Device must be tested and approved by the City of Grand Junction Water Services Division when installed.
- h. In no case is it permissible to connect the relief valve discharge on the reduced pressure device to a sump, drainage ditch, etc.

(9) All backflow prevention devices shall be installed in an accessible location to facilitate maintenance, testing and repair.

(10) All backflow prevention devices shall be installed downstream of the water meter.

(11) Before installing a backflow prevention device, pipelines should be thoroughly flushed to remove foreign material.

(12) Backflow prevention valves are not to be used as the inlet or outlet valve of the water meter. Test cocks are not to be used as supply connections.

(13) In order to ensure that backflow prevention devices continue to operate satisfactorily, it will be necessary that the device(s) be tested at the time of installation and on an annual schedule thereafter. Such test(s) shall be conducted in accordance with ASSE field test procedures, as directed by the Colorado Department of Health, to ASSE performance standards.

(14) The City of Grand Junction Water Service division shall inspect all installations.

(15) All costs for design, installation, maintenance, repair and testing are to be borne by the customer.

(g) Testing and Maintenance:

(1) At least once per year, each customer/user at any home, building, facility or structure where any backflow prevention device(s) is (are) installed shall have a certified test made of the device(s) and deliver to the City a copy of the test results. In those specific instances where the director of Public Works of the City deems the hazard to be great enough, certified inspections

and/or tests may be required more often. Any and all tests shall be at the expense of the water user and shall be performed by a State of Colorado certified technician. An inspection of the device may be performed at any time. Inspections shall comply with section “(h)” of this document.

(2) As necessary or required, the device(s) shall be repaired or replaced at the expense of the customer/user whenever the device(s) is/are found to be defective. Records of all such tests, repairs or replacement shall be kept by customer/user, a copy of which shall be submitted to the City of Grand Junction Water Services Cross-Connection Control Coordinator.

(3) All testing gauges used in the City water system shall be checked yearly for accuracy. Testing shall be with a water column yearly, or more often, and the City of Grand Junction Water Services division shall maintain proof of compliance.

(4) The City retains the right to test or otherwise check the installation and operation of any device(s) at any time to assure proper operation.

(h) Right of Entry:

Representatives of the City shall carry proper identification of his/her office. By previously arranged appointment and upon presentation of proper identification, the City representative shall have the right of entry to inspect any and all buildings and premises for cross-connections and possible water contamination hazards. This right of entry shall be a condition of water service in order to protect the health, safety and welfare of the people throughout the City distribution system. Where building security is required, the backflow device(s) shall be located in an area not subject to security. Questions regarding proper credentials should be directed to the City Director of Public Works and/or the City Attorney.

(i) Compliance:

(1) Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by this resolution shall be grounds for the discontinuance of water service to the premises and/or the requirement for an air-gap separation from the public potable water system.

(2) Service of water to any premises may be discontinued by the City if cross-connections exist on the premises. When any defect is found in an installed backflow prevention device, or if a backflow prevention device has been removed or by-passed, the service may be discontinued. Service shall not be restored until such condition(s) or defect(s) are corrected.

(3) Discontinuance of service may be summary, immediate and without written notice whenever, in the judgment of the City, such action is necessary to protect the purity of the public potable water supply or the safety of the water system.

PASSED and ADOPTED this 4th day of August, 1999.

Attest:

Stephanie Nye  
City Clerk

Gene Runsey  
President of Council