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SECTION I - GENERAL

1.1 Authority

Authority to implement and maintain this Cross-Connection control program is contained in these Rules and Regulations and the following documents:


4. Occupational Safety and Health Administration Federal Register #202 part 2, page 22234, subparts J.

5. The most recently adopted version of the International Building Code.


7. The most recently adopted version of the International Pool and Spa Code.

The following manuals are incorporated into these Rules and Regulations and the District’s Cross-Connection control program, by reference:


1.2 Protection of Potable Water Quality

The District is responsible for protecting the potable public water supply from contamination or pollution that could enter the Water System through a connection from another water system or by means of backflow from a customer’s system.
SECTION II – DEFINITIONS

The definitions below pertain only to this Appendix of the Rules and Regulation. Definitions provided in Article II of the Rules and Regulations apply in this Appendix.

2.1 Air Gap

An “Air Gap” is the unobstructed separation or physical break between the supply of water from the Water System and the location of use of the water by the Customer.

2.2 Approved

Accepted by the District as meeting the applicable specification or procedures of these Rules and Regulations.

2.3 Approved Backflow Prevention Device (Assembly)

A device listed in the latest University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR) "List of Approved Backflow Prevention Assemblies", and Approved by the District.

2.4 Auxiliary Water Supply

Any water supply on or available to the premises other than that which is provided directly from the Water System. Auxiliary water supplies may include, but are not limited to, water from the District’s Water System over which the District does not control the water quality, such as where an Air Gap has been made, or from any other water supply or natural source(s) such as a well, spring, river, stream, pond, or lake.

2.5 Backflow

The actual or potential undesirable reversal of the direction of flow of the water or the mixture of water and other liquids, gases, or other substances into the pipes of the Water System from any source or sources caused by Back Pressure and/or Back Siphonage.

2.6 Backflow Prevention Device or "Backflow Preventer"

A general term for any device or means designed to prevent Backflow created by Back Pressure, Back Siphonage or Back Pressure and Back Siphonage acting together.
SECTION II – DEFINITIONS

2.7 Back Pressure

Backflow caused by a pump, elevated tank, boiler, or "head" in pipe, or any means that creates greater pressure within a piping system than that which exists within the Water System.

2.8 Back Siphonage

The actual or potential reverse flow of water or contaminants into the Water System caused by negative or sub-atmospheric pressure in the Water System.

2.9 Certified Cross-Connection Control Technician

A person certified as such by the American Backflow Prevention Association (ABPA) or American Society of Sanitary Engineering (ASSE).

2.10 Check Valve

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.

2.11 Colorado Department of Health Cross-Connection Control Manual

A manual that has been published by the State addressing Cross-Connection control practices.

2.12 Containment

Protection by Containment shall mean the installation of an Approved Backflow Prevention Device, or method, on the Water Service serving any premises, location, facility or area. Protection by Containment shall be used when the potential exists for the Water System to become contaminated or polluted by substances used or stored within a building or premises.

2.13 Contamination, Contaminated

The degradation of the water quality relative to state and Federal standards to which the District’s water supply is regulated by the Colorado Department of Health and Environment and the Environmental Protection Agency, or otherwise creates a potential Hazard to the public health through the introduction of any physical, chemical, biological, or radiological substance or matter to the Water System.
2.14 Critical Level

The Critical Level or other regulated “C/L marking” on a Backflow Prevention Device or Vacuum Breaker which is a point conforming to standards and established by a 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.

2.15 Cross-Connection

Any physical arrangement whereby a Potable Water supply is connected, directly or indirectly, with any other water supply system, wastewater, 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 contaminating the Water System 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.

2.16 Cross-Connections, Controlled

Having an accepted Cross-Connection control device properly installed and maintained. This device shall continuously provide Cross-Connection protection commensurate with the Degree of Hazard.

2.17 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.

2.18 Flood-Level Rim

The edge of the receptacle from which liquid overflows.

2.19 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 State of Colorado.
2.20 Hazard, Health

Any condition, device, or practice in the Water System or Services which creates, in the judgment of the District, an actual or potential danger to the health or well-being of a water consumer. An example of a Health Hazard is a structural defect, including Cross-Connections, in the Water System, or a direct connection of the Water System to a Wastewater System or any source of water or Contamination. The presence of any potential for a Health Hazard requires the installation of an Approved Backflow Device.

2.21 Hazard, Plumbing

A type of Cross-Connection that results from a fixture, fitting or connection in the Water System or Water Service that has not been properly protected by an air-gap separation, or an Approved Backflow Prevention Device. A Plumbing Hazard is deemed to be a Health Hazard.

2.22 Hazard, Pollution

An actual or potential threat to the physical properties of the water in the Water System which would constitute a nuisance or be aesthetically objectionable or cause damage to the Water System or its appurtenances, but would not be a threat to life or health as determined by the State of Colorado.

2.23 Hazard, System

An actual or potential threat of severe damage to the physical properties of the water in the Water System, such as Contamination which would have a protracted effect on the quality of the water in the Water System, caused by a Cross-Connection.

2.24 Industrial Fluids System

Any system containing a contaminated fluid or solution in a form or concentration that would constitute a health, system, Pollution or Plumbing Hazard if introduced into the Water System. This may include, but is not be limited to: all types of process waters and "used waters" which may or may not have originated from the Water System, but whose quality has deteriorated or has the potential to deteriorate to a level considered to be Contaminated. Examples of industrial fluids and Industrial Fluid Systems include but are not limited to: 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; circulating heating waters or chemicals; natural waters such as from wells, springs, streams, rivers, lakes, dams, ponds, retention pits, irrigation canals or systems; oils, gases, glycerin, glycols,
paraffins, caustic and acid solutions and other liquid and gaseous fluids used in industrial, fire-fighting or other purposes.

### 2.25 Isolation

The control of a Cross-Connection within a building's Plumbing system by the installation of an Approved Backflow Prevention Device or means or methods at the potential sources of Contamination.

### 2.26 Non-Potable Water

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.

### 2.27 Pollution – see Contamination.

### 2.28 Potable Water

Water that meets the regulatory standards of the Colorado Department of Health and Environment and the Environmental Protection Agency for drinking water.

### 2.29 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.

### 2.30 Submerged Inlet

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 Non-Potable Water.

### 2.31 Vacuum

Any pressure less than atmospheric pressure.

### 2.32 Vacuum Breaker, Atmospheric Non-Pressure Type

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.

2.33 Vacuum Breaker, Pressure Type

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.

2.34 Water Service

Refer to Article II of the Rules & Regulations, Water Service.
SECTION III – APPROVED BACKFLOW PREVENTION DEVICE

3.1 Approved Backflow Prevention Device (Assembly) Required

Per 25-1-114, 25-1-114.1, C.R.S. and these Rules and Regulations, an Approved Backflow Prevention Device (Assembly) is required on all Water Services. All laws and regulations apply as of the adoption of these Rules and Regulations, regardless of the age of the Water Service and/or the age of the building, home, facility or structure served. No “grandfathering” of this requirement exists or shall be asserted.

1. All fire sprinkler systems shall conform to the National Fire Protection Association (NFPA) pamphlets number thirteen and twenty-four.
2. All fire sprinkler services shall have a minimum protection of an Approved Double Check Valve for Containment of the system, and all valves and assembly plumbing shall be Approved by the local fire protection jurisdiction.
3. Backflow devices used on fire lines shall have outside stem and yoke (OS&Y) valves and be listed by the National Fire Protection Association.
4. All glycol (ethylene or propylene) or anti-freeze fire suppression systems shall have an Approved Reduced Pressure Zone Device for Containment.
5. Dry fire systems shall have an Approved Double Check Valve installed upstream of the air pressure valve.
6. A residential unit with a common fire sprinkler and domestic Water Service shall have a double Check Valve when no chemicals are used.
7. All Backflow Prevention Devices (Assemblies) shall be Approved by the District.
8. Backflow Preventers that do not meet the requirements of the District shall be replaced with an Approved Backflow Prevention Device (Assembly) at the time the device fails an operational test specified by the District.

3.2 Submittal Requirements:

For determination of the need and type of Backflow Prevention Device required, a complete set of building plans, Approved by the applicable building permit authority, is required to be submitted by the Customer with a New Account Application.

3.3 Standards for Backflow Prevention Devices:

The District will determine the need and type of Backflow Prevention Device appropriate to the Customer’s water use.
3.4 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 by the District prior to use.
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, and Approved by the District.
4. A Pressure Type Vacuum Breaker shall be used where the device 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. An atmospheric non-Pressure Type Vacuum Breaker shall be used only where the device is:
   a. Never subjected to more than 12 hours continuous pressure;
   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; and
   c. No valves shall be installed downstream of atmospheric non-Pressure Type Vacuum Breakers.
6. A single Check Valve shall not be considered to be a Backflow Prevention Device.
7. A Double Check Valve Assembly may be installed in a below-grade vault when the vault is properly constructed, in accordance with Approved plans, Degree of Hazard, 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;
   b. There is a drain twice the diameter of the service to daylight;
   c. It is installed in a horizontal position; and
   d. It is installed a minimum of 12 inches and a maximum of 36 inches from the floor.
9. Basement installations:
   a. May be made where 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. Refer to flow chart in Colorado Cross Connection Control Manual, Appendix 3;
   b. 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 an adequate Air Gap at the termination of the run;
10. The reduced pressure Backflow Preventer shall be kept from freezing.
11. All assemblies installed within a confined area must allow enough room for testing and maintenance;
12. Device must be tested and Approved by the District when installed; and
13. In no case is it permissible to connect the relief valve discharge on the reduced pressure device to a sump, drainage ditch, etc.
14. All Backflow Prevention Devices shall be installed in an accessible location to facilitate maintenance, testing and repair.
15. All Backflow Prevention Devices shall be installed downstream of the water meter.
16. Before installing a Backflow Prevention Device, pipelines will be thoroughly flushed to remove foreign material.
17. 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.
18. 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 or ABPA field test procedures, as directed by the Colorado Department of Health, to ASSE or ABPA performance standards.
19. The District shall inspect all installations.
20. All costs for design, installation, maintenance, repair and testing are to be borne by the Customer.
SECTION IV – TESTING AND COMPLIANCE

4.1 Testing and Maintenance

At least once per year, each Customer shall have a certified test conducted on the Backflow Prevention Device on each of its Water Services and deliver the certificate and results of the test to the District. In those specific instances where the District deems the Hazard to be great enough, certified inspections and/or tests may be required more than once per year. Any and all tests shall be at the expense of the Customer and shall be performed by a certified technician. An inspection of the device may be performed by the District at any time.

As necessary or required, the Customer’s Backflow Prevention Device(s) shall be repaired or replaced at the expense of the Customer whenever the device is found to be defective. Records of all such tests, repairs or replacement shall be kept by Customer, a copy of which shall be submitted to the District.

All testing gauges used in the District Water System shall be checked yearly for accuracy.

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

4.2 Compliance

Failure of the Customer to cooperate in the installation, maintenance, testing or inspection of Backflow Prevention Devices shall be considered a violation of these Rules and Regulations and therefore subject to Section 3.6, Violator’s Liability.

Service of water to a Customer may be revoked per Article I, Discontinuance or Revocation of Service, if an actual or potential Cross-Connection is found to exist on a Customer’s property. Service may also be revoked when any defect is found in an installed Backflow Prevention Device, or if a Backflow Prevention Device has been removed or by-passed. Reinstatement of service is subject to Article I, Reinstatement of Service.