

ORDINANCE NO. 47A

AN ORDINANCE REGULATING BACKFLOW AND CROSS-CONNECTIONS FOR THE WATER DEPARTMENT OF THE TOWN OF STRATTON.

THE BOARD OF TRUSTEES OF THE TOWN OF STRATTON, COLORADO ORDAINS:

Sections:

- 1 Definitions.
- 2 Requirements.
- 3 Compliance procedures
- 4 Violations and penalties.

SECTION 1 Definitions. Unless the context specifically indicates otherwise, the meanings of terms used in this chapter shall be as follows:

1. "Air gap" 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 vessel. An approved air-gap shall be at least double the diameter of the supply pipe, measured vertically, above the flood level rim of the vessel; and, in no case less than one inch.

2. "Approved" means accepted by the utility as meeting the applicable specification stated or cited in this chapter, or as suitable for the proposed use.

3. "Auxiliary water supply" 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(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 utility does not have sanitary control.

4. "Backflow preventer" means a device or means designed to prevent backflow created by backpressure or backsiphonage.

5. "Back pressure" means backflow caused by a pump, elevated tank, boiler or means that could create an elevated pressure within the nonpotable system greater than the supply pressure.

6. "Backsiphonage" means the flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by negative or subatmospheric pressure in the potable water supply system.

7. "Certified tester" means a person who has passed an approved testing course and who is listed by the town as a certified tester.

8. "Check valve" means a self-closing device which is designed to permit the flow of fluids in one direction and to close if there is a reversal of flow.

9. "Colorado Department of Health Cross Connection Control Manual" means a manual that has been published by the state addressing cross-connection control practices which will be used as a guidance document for the utility in implementing a cross-connection control program as outlined in Section 2.

10. "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 an actual hazard to the public health through poisoning or through the spread of disease.

11. "Critical level" means the critical level C-L or C/L marking on a backflow prevention device or vacuum breaker which is a point conforming to approved standards and established by the testing laboratory (usually stamped on the device by the manufacturer), 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.

12. "Cross-connection" means any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains, or may contain, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water supply as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, four-way valve connections, and other temporary or permanent devices through which, or

because of which, backflow could occur are considered to be cross-connections.

13. "Cross-connections, controlled" means a connection between a potable water system and a nonpotable water system with an approved backflow prevention device properly installed that will continuously afford the protection commensurate with the degree of hazard.

14. "Double check valve assembly" means an assembly of two independently operating approved check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specifications and approval of a recognized and utility-approved testing establishment for backflow prevention devices. To be approved, these devices must be readily accessible for in-line maintenance and testing and be installed where no part of the device will be submerged.

15. "Flood-level rim" means the edge of the receptacle from which liquid overflows.

16. "Hazard, degree of" means 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.

17. "Hazard, health" means any condition, device, or practice in the water supply system and its operation which could create, or in the judgment of the Town Water Administrator may create, a danger to the health and well-being of the 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.

18. "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 backflow prevention device. Unprotected plumbing type cross-connections are considered to be a health hazard.

19. "Hazard, polluttional" means 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 dangerous to health.

20. "Hazard, system" means an actual or potential threat of severe damage to the physical properties of the public 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.

21. "Industrial fluids system" means any system containing a 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, pollutional 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 public potable water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalies, circulated cooling waters connected to any 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 systems, etc.; oils, gases, glycerine, parafins, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other purposes or for fire-fighting purposes.

22. "Nonpotable water" means water that is not safe for human consumption or that is of questionable quality.

23. "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 hazard or impair its usefulness.

24. "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 with State of Colorado Primary Drinking Water Regulations.

25. "Reduced pressure principle device" means an assembly of two independently operating approved check valves with an automatically operating differential relief valve between the two check valves, tightly closing shut-off valves on either side of the check valves, plus properly located test cocks for the testing of the check and relief valves. The entire assembly shall meet the design and performance specifications and approval of a recognized and utility approved testing agency for backflow prevention assemblies. The device shall operate to maintain the pressure in the zone between the two check valves at a level less than the pressure on the public water supply side of the devices. At cessation of normal flow the pressure between the two check valves shall be less than the pressure on the public water supply side of the device. In case of leakage of either of the check valves the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. To be approved, these devices must be readily accessible for in-line maintenance and testing and be installed in

a location where no part of the device will be submerged and the relief valve will be provided an air gap as described in subsection 1.

26. "Town" means Town of Stratton, County of Kit Carson, State of Colorado.

27. "Town Water Administrator" means the administrator of municipal water utilities of the city or his/her duly authorized representative.

28. "Submerged inlet" means a water pipe or extension thereto from a public water supply terminating below the flood level rim in a tank, vessel, fixture or appliance which may contain water of questionable quality, waste or other contaminant and which is unprotected against backflow.

29. "Utility" means the Town of Stratton water utility, and is vested with the authority and responsibility for the enactment and enforcement of this chapter.

30. "Vacuum" means any pressure less than that exerted by the atmosphere.

31. "Vacuum breaker, atmospheric nonpressure type" means a vacuum breaker consisting of an air inlet opening and a nonloaded check disk valve designed to prevent backsiphonage 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 hours in any twenty-four-hour period.

32. "Vacuum breaker, pressure type" means a vacuum breaker consisting of a spring-loaded check valve, an air inlet opening, a shut off valve on each side of the device, and two appropriately located test cocks designed to prevent backsiphonage only. The device shall not be subjected to backpressure.

33. "Water-service connection" means the terminal end of the city's 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 customer's stop box or shut-off valve or meter, which ever comes first from the utility water main. 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 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. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system. For customers outside the city limits "water

service connection" means the terminal end of the city's service connection from the public potable water system to the customer's corporation stop.

SECTION 2 Requirements. A. Establishment of Cross-connection Control Program. The Town Water Administrator or his/her designated agent is vested with the authority and responsibility for implementing an effective cross-connection control program in accordance with this chapter and for enforcement thereof. If in the judgment of the Town Water Administrator an approved backflow prevention device is required at the city's water service connection to any customer's premises for the safety of the water system, the Town Water Administrator shall give notice in writing to the customer to install such an approved backflow prevention device at each service connection to his/her premises.

B. Inspections and Testing Procedures. The Town Water Administrator shall have the authority and the access to inspect any system owned and maintained by a utility customer to determine whether the system should have a backflow prevention device and to determine the extent and degree of hazard. It shall be the duty of the utility at any premises where backflow prevention devices are installed to have certified inspections and operational tests made upon installation and at least once per year thereafter. In those instances where the Town Water Administrator deems the hazard to be great enough, he/she may require certified tests at more frequent intervals. These inspections and tests shall be performed by a certified tester under contract to the customer. The Town Water Administrator also reserves the right to inspect installed backflow prevention device(s) at any time and without prior notification to ensure the device(s) are in proper working order. The device(s) shall be repaired, overhauled or replaced whenever the devices are found to be defective. Records of such tests, repairs, and overhaul, including materials and parts changed, shall be kept and reported immediately to the Town Water Administrator.

C. Water System. The water system shall be considered as made up of two parts: the utility system and the customer system. The utility system shall consist of the source facilities of the water system under the complete control of the utility, up to the point where the customer's system begins. The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of water to the distribution system. The distribution system shall include the network of conduits used for the delivery of water from the source to the customer's system. The customer's system shall include those parts of the facilities beyond the termination of the utility distribution system which are utilized in conveying utility-delivered domestic water to points of use.

D. Policy.

(1) No water service connection to any premises shall be installed or maintained unless the water supply is protected as required by Colorado Revised Statutes and Regulations of the Colorado Department of Health and as required by this title. Service of water to any premises shall be discontinued by the utility if a backflow prevention device required by this chapter is not installed within a time period specified by the Town Water Administrator, or if it is found that a backflow prevention device has been removed, by-passed, or if an unprotected cross-connection exists on the premises. Service will not be restored until such conditions or defects are corrected. The customer's system shall be open for inspection at all reasonable times to authorized representatives of the Town Water Administrator to determine whether cross-connections or other structural or sanitary hazards, including violations of these regulations exist. When such a condition becomes known, the Town Water Administrator shall, at his/her option, deny, or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) or shall specify a date for compliance, in conformance with state and city statutes relating to plumbing and water supplies and the regulations adopted pursuant thereto.

(2) When, as a result of inspection by authorized representatives of the utility, a condition involving violation of this chapter resulting in a health or sanitary hazard is determined to exist, the Town Water Administrator shall have the option of immediate discontinuance of service to the premises until the customer-user has corrected the condition in conformance with this chapter, or he may specify a date for compliance after which time he may discontinue service until the customer has corrected the condition.

E. Premises Requiring the Installation of Backflow Prevention Devices. An approved backflow prevention device shall be installed at or near the property line or immediately inside the structure being served; but in all cases before the first branch line leading off the service line wherever the following conditions exist:

(1) In the case of premises having an auxiliary water supply which is not or may not be of safe bacteriological or chemical quality and which is not acceptable as an additional source by the director for municipal utilities, the city water system shall be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard.

(2) In the case of premises on which any industrial fluids or any other objectionable substance is handled in such a fashion as to create

an actual or potential hazard to the city water system, the city system shall be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard. This shall include the handling of process waters and waters originating from the utility system which have been subject to deterioration in quality.

(3) In the case of premises having (a) internal cross-connections that cannot be permanently corrected and controlled, or (b) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross-connections exist, the city water system shall be protected against backflow from the premises by installing a backflow prevention device in the service line.

(4) If the backflow prevention device is located such that the meter becomes contaminated, it is the responsibility of the customer to bear the cost of decontamination. All backflow prevention devices shall be located and installed according to the manufacturer's specifications and in accordance with this chapter. The Town Water Administrator shall review and approve all plans as to the location and installation of backflow prevention device(s) so as to prevent freezing and contamination of city-owned property, as well as to facilitate inspection and testing.

F. Type of Backflow Prevention Device Required. The type of protective device required shall depend upon the degree of hazard which exists as follows:

(1) In the case of any premises where there is an auxiliary water supply and it is not subject to any of the following rules, the city water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device.

(2) In the case of any premises where there is water or substance that would be objectionable but not hazardous to health if introduced into the city water system, the city water system shall be protected by an approved double check valve assembly.

(3) In the case of any premises where there is any material dangerous to health which is handled in such a fashion as to create an actual or potential hazard to the city water system, the city water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device. Examples of premises where these conditions will exist include, but are not limited to, sewage treatment plants, sewage pumping stations, chemical manufacturing plants, hospitals, mortuaries, and plating plants.



(4) In the case of any premises where there are "uncontrolled" cross-connections either actual or potential, the city water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device at the service connection.

(5) In the case of any premises where, because of security requirements or other prohibitions or restrictions it is impossible or impractical to make a complete in-plant cross-connection survey, the city water system shall be protected against backflow or back siphonage from the premises by the installation of a backflow prevention device in the service line. In this case, maximum protection will be required; that is, an approved air-gap separation or an approved reduced pressure principle backflow prevention device shall be installed in each service to the premises.

(6) In the case of any premises where there is a grey water (used or untreated water) recycling system, the city water system shall be protected by a reduced pressure principle backflow preventer.

(7) In the case of any premises where a liquid-based solar system is installed, whether utilized for space or water heating, the city water system shall be protected against possible backflow or nonpotable substances into the potable water distribution system as follows:

a. In cases where a toxic transfer medium is being used, the means of backflow protection and exchange of heat shall be accomplished by way of an approved double-walled heat exchanger. An exception to this requirement may be granted in the event of single-walled heat exchanger(s) receiving the water utility's approval, and used in conjunction with an expansion tank and an approved reduced pressure principle assembly.

b. In cases where a nontoxic transfer medium is being used, the means of backflow protection and exchange of heat shall be accomplished by way of an approved double-walled heat exchanger. An exception to this requirement may be granted in the event of single-walled exchanger(s) receiving the utility's approval, and used in conjunction with an expansion tank and an approved reduced pressure principle assembly.

c. In cases where a single fluid solar domestic hot water preheat system which utilized drain-down design for freeze protection is being used, drain lines shall be connected to an approved, properly trapped and vented receptor with a visible air gap of at least three times the diameter of the drain line with a fixed minimum air gap of one inch above the flood level of the receptor.

d. In cases where a solar system utilizes an approved fancoil unit to exchange heat from the hot air to preheat water for domestic uses, no backflow protectors will be required; however, if the fancoil unit utilizes drain-down freeze protection, the drain from exchange coil shall conform to the same requirements of aforementioned single fluid drain-down solar systems.

G. Installation Requirements for Air Gaps Used to Prevent Backflow.

(1) An approved air gap separation shall mean the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe, conduit, or faucet which supplies (discharges) potable water to a vessel, tank, waste line, plumbing fixture, or other device and the flood level rim of the vessel.

(2) An air gap shall be installed by the water customer if the degree of hazard is high, and there is a potential risk of contamination to the public water supply.

(3) An air gap separation shall be installed:

a. Downstream of the service connection water meter;

b. Such that no hose, piping arrangement, or other fixture may be attached to defeat the air gap separation. This includes any solid funnel arrangement installed to prevent splashing;

c. Where a drain is located and properly sized to adequately drain the maximum discharge from the potable supply line;

d. Where the potable water line is protected from freezing;

e. In such an arrangement that the potable water supply line is at a vertical distance of at least two inside pipe diameters (of the potable supply line) above the flood level of the receiving vessel, and in no case shall the air gap between the potable line and receiving vessel be less than one inch;

f. When the potable supply line discharge is within two inside pipe diameters of any wall or protrusion, the required vertical air gap between the potable supply discharge and receiving vessel shall be extended to a minimum of three inside pipe diameters of the potable supply line;

g. An air gap separation which is protecting the potable water distribution system shall be considered a backflow prevention device,

and it shall be inspected at least annually, or more frequently if required by the utility.

H. Installation Requirements for Approved Reduced Pressure Principle Backflow Prevention Devices;

(1) An approved reduced pressure principle backflow prevention (RP) device shall mean an assembly which contains two shut-off valves, two independently-operating, internally-loaded check valves, four test cocks and a relief valve which opens to atmosphere. All RP devices installed within the city potable water distribution system shall be laboratory tested and approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research and shall appear on the State of Colorado list of approved devices.

(2) An RP device shall be installed on a water customer's service connection if the degree of hazard is high and there is a potential risk of contamination to the public water supply. An RP device may be installed on a low hazard connection where a potential risk of pollution exists.

(3) A reduced pressure principle (RP) device shall be installed:

a. A minimum vertical distance of twelve inches or two inside pipe diameters of the device relief valve (whichever is greatest) above the floor or ground and in such a manner that the lowest part of the device shall not exceed thirty inches above the floor or ground level;

b. In an upright position, with the relief valve down;

c. With an appropriately sized strainer on devices sized two inches and smaller;

d. In a horizontal position, unless the plans and specifications for the installation have been reviewed and approved by the utility. In order for a vertical installation to be considered by the utility, the water flow through the device must be in an upward direction, and the relief valve opening on the device must be at a lower elevation than the lowest point of the upstream check valve, without any alteration to the factory assembly;

e. In such a manner that the side opposite the test cocks on the device shall have a minimum of twelve inches clearance between the device and any adjacent wall, fixture or ceiling;

f. In such a manner that the side containing the test cocks shall have a minimum of twenty-four inches clearance between the adjacent wall, other fixtures, floor, ground level, or ceiling;

g. Without any bypass, unless the bypass line also contains an RP device of equal size;

h. With full port/quarter turn ball valves for the upstream and downstream shut-off valves or devices sized two inches or less;

i. With butterfly valves for the upstream and downstream shut-off valves on devices sized two and one-half inches and larger;

j. Immediately following the water service connection meter either above ground or at the point where the potable supply line enters the building or structure with no other connection between the backflow prevention device and the meter;

k. In such manner that no paint or other finishing material shall cover or be applied to the name plate containing the manufacturer's name, model number, serial number, size, etc., or the inside threads of any test cocks or fittings of the device which would affect the operational integrity of the device or impair any certified test of the device;

l. In such manner as to prevent vandalism to the device, or deterioration of the device due to atmospheric conditions;

m. In such a manner that the relief valve opening shall never have a water level under the device come within a vertical distance of two inside diameters of the relief valve opening;

n. With no other plumbing fixture or conduit fitting between the two shut-off valves of the device other than the factory manufactured assembly;

o. In such manner that the device would not be located either above or below a hazardous location, such as a chemical mixing tank or an electrical switch fuse box and access to the device would not present a hazard to the testor/inspector;

p. With no other plumbing fixture or piping branch between the water service meter and the backflow prevention device;

q. With an air gap at the relief valve opening discharge. The air gap at the relief valve shall meet all the requirements of the air gap stated above in subsection G of this section;

r. In such a manner that the RP can be properly drained to prevent damage from freezing. A stop and waste valve located upstream of the device and located in a pit shall not be allowed for this purpose.

s. With an electrical jumper connection attached upstream of the first test cock and downstream of the second shut-off valve.

(4) RP devices which are not approved by the State of Colorado shall be tested on a sixty-day interval, and upon failure of any valve within the device, the backflow preventer shall be replaced within a period of ten business days with an approved RP device.

(5) An RP device may be installed outside of a building. However, the following items must be addressed:

a. A reduced pressure principle device shall not be installed in a pit or vault if the pit or vault is not provided with a drain to daylight. The drain shall be sized to carry the maximum possible discharge from the device under fouled conditions. The drain shall be provided with a twenty-four mesh noncorrodible screen at the discharge to prevent any material from entering the waste line and creating a plug. A sump pump shall not be utilized in lieu of a drain to daylight;

b. The handles of the shut-off valves may be removed or chained together to prevent unauthorized shut-off of the water service;

c. Installation of an RP device above ground in a small enclosure is acceptable provided that the enclosure has noncorrodible screened openings at the bottom which will provide the necessary drainage meeting the requirements of the air gap described in subsection G of this section.

(6) Repair Parts.

a. Only those replacement parts produced or specifically recommended by the manufacturer of the RP device shall be used in the repair of the backflow preventer. Any other parts utilized shall be considered a modification of the factory design, and the RP device shall be considered unapproved.

b. Any used part made of organic material shall not be allowed for the permanent repair of an RP device. This includes the reuse of parts such as organic seats from check valves which are reversed. Used

parts installed for temporary emergency repair purposes shall be noted as such and shall be replaced within ten business days with new replacement parts.

c. Any replacement parts which have expired shelf life dates stamped on the box shall not be utilized as repair parts.

#### I. Installation Requirements for Approved Double Check Valve Assemblies.

(1) An approved double check valve assembly (DCVA) shall mean an assembly which contains two shut-off valves, two independently-operating, internally-loaded check valves, and four test cocks. All DCVA's installed within the city potable water distribution system shall be laboratory tested and approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research, and shall appear on the Colorado list of approved devices.

(2) A double check valve assembly shall be installed on a water customer's service connection if the degree of hazard is low, and there is a potential risk of pollution to the public water supply. An RP device or air gap may be installed on a low hazard connection.

(3) A double check valve assembly shall be installed:

a. A minimum vertical distance of twelve inches above the floor or ground and in such a manner that the lowest part of the device shall not exceed thirty inches above the floor or ground level;

b. In an upright position;

c. With an appropriately sized strainer on devices sized two inches and smaller;

d. In a horizontal position, unless the plans and specifications for the installation have been reviewed and approved by the utility;

e. In such a manner that the side opposite the test cocks on the device shall have a minimum of twelve inches clearance between the device and adjacent wall, fixtures, or ceiling;

f. In such a manner that the side containing the test cocks shall have a minimum of twenty-four inches clearance between the adjacent wall, fixtures, floor, ground level, or ceiling;

g. Without any bypass, unless the bypass line also contains a double check valve assembly or reduced pressure principle device of equal size.

h. With full port/quarter turn ball valves for the upstream and downstream shut-off valves on devices sized two inches or less;

i. With butterfly valves for the upstream and downstream shut-off valves on devices larger than two inches.

j. Immediately following the water service connection meter either above ground or at the point where the potable supply line enters the building or structure with no other connection between the backflow prevention device and the meter;

k. In such a manner that no paint or other finishing material shall cover or be applied to the name plate containing the manufacturer's name, model number, serial number, size, etc., or the inside threads of any test cocks or fittings of the device which would affect the operational integrity of the device or impair any certified test of the device;

l. In such a manner as to prevent vandalism to the device, or deterioration of the device due to atmospheric conditions;

m. With no other plumbing fixture or conduit fitting between the two shut-off valves of the device other than the factory manufactured assembly;

n. In such a manner that the device would not be located either above or below a hazardous location, such as a chemical mixing tank or an electrical switch fuse box, and where access to the device would not present a hazard to the tester/inspector.

o. With no other plumbing fixture or piping branch between the water service meter and the backflow prevention device;

p. In such a manner that the DCVA can be properly drained to prevent damage from freezing. A stop and waste valve located upstream of the device and located in a pit shall not be allowed for this purpose;

q. With an electrical jumper connection attached upstream of the first test cock and downstream of the second shut-off valve.

(4) DCVA's which are not approved by the the State of Colorado shall be tested on a sixty day interval, and upon failure of any valve

within the device, the backflow preventer shall be replaced within a period of ten business days with an approved DCVA.

(5) A DCVA may be installed outside of a building. However, the following items must be addressed:

a. A DCVA may be installed in a pit or vault where provisions are made to prevent any portion of the device from becoming submerged. A drain to daylight is not required. If a drain is provided, however, the drain shall have a twenty-four mesh noncorrodible screen at the discharge to prevent any material from entering the waste line and creating a plug. A sump pump may be utilized in lieu of a drain to daylight.

b. The handles of the shut-off valves may be removed or chained together to prevent unauthorized shut-off of the water service.

c. Any pit or vault containing a DCVA shall meet each of the criteria outlined in subsection H of this section.

(6) Repair Parts.

a. Only those replacement parts produced or specifically recommended by the manufacturer of the DCVA shall be used in the repair of the backflow preventer. Any other parts utilized shall be considered a modification of the factory design, and the DCVA shall be considered unapproved.

b. Any used part made of organic material shall not be allowed for the permanent repair of a DCVA. This includes the reuse of parts such as organic seats from check valves which are reversed. Used parts installed for temporary emergency repair purposes must be so noted and shall be replaced with new parts within ten business days.

c. Any replacement parts which have expired shelf life dates stamped on the box shall not be utilized as repair parts.

J. Installation Requirements for Pressure Vacuum Breakers. (See subsection R.)

(1) An approved pressure vacuum breaker (PVB) shall mean an assembly which contains an upstream and downstream shut-off valve, two properly located test cocks, one or two internally loaded check valves, and a spring loaded popet valve opening to atmosphere. All PVB's installed within the city potable water distribution system shall be laboratory tested and approved and shall appear on the Colorado list of approved devices.



(2) A pressure vacuum breaker installed within a water customer's plumbing system shall not be considered a containment device, and the use of a pressure vacuum breaker in lieu of a containment device such as a reduced pressure principle device or a double check valve assembly at the service connection shall not be allowed except as described in subsection R of this section.

(3) A pressure vacuum breaker shall be installed:

a. With the critical level of the device a minimum of twelve inches above the highest point of downstream usage;

b. In an upright position;

c. In a location where the device shall not be subjected to backpressure;

d. At locations where the device may be subjected to continuous pressure;

e. In such a manner that the side containing the test cocks shall have a minimum of twenty-four inches clearance between the adjacent wall fixtures, floor, ground level, or ceiling;

f. Without any bypass, unless the bypass also contains a PVB, a DCVA or RP device of equal size;

g. With full port/quarter turn ball valves for the upstream and downstream shut-off valves on devices sized two inches or less;

h. In such a manner that no paint or other finishing material shall cover or be applied to the name plate containing the manufacturer's name, model number, serial number, size, etc., or the inside threads of any test cocks or fittings of the device which would affect the operational integrity of the device or impair any certified test of the device;

i. In such a manner as to prevent vandalism to the device, or deterioration of the device due to atmospheric conditions;

j. With no other plumbing fixture or conduit fitting between the two shut-off valves of the device other than the factory manufactured assembly;

k. In such a manner that the device would not be located either above or below a hazardous location, such as a chemical mixing tank or an electrical switch fuse box, and where access to the device would not present a hazard to the tester/inspector;

l. In such a manner that the PVB can be properly drained to prevent damage from freezing. A stop and waste valve located upstream of the device and located in a pit shall not be allowed for this purpose.

(4) PVB devices which are not approved by the State of Colorado shall be tested on a sixty-day interval, and upon failure of any valve within the device, the backflow preventer shall be replaced within a period of ten business days with an approved PVB device.

(5) Replacement Parts.

a. Only those replacement parts produced or specifically recommended by the manufacturer of the PVB device shall be used in the repair of the backflow preventer. Any other parts utilized shall be considered a modification of the factory design, and the PVB device shall be considered unapproved.

b. Any used part made of organic material shall not be allowed for the permanent repair of a PVB device. This includes the reuse of parts such as organic seats from check valves which are reversed. Used parts installed for temporary emergency repairs must be so noted and shall be replaced with new parts within ten business days.

c. Any replacement parts which have expired shelf life dates stamped on the box shall not be utilized as repair parts.

K. Installation Requirements for Double-Check Detector-Check Valve Assemblies (Special-application).

(1) A double-check detector valve assembly shall consist of a large double check valve assembly with a smaller bypass line which consists of a double check valve assembly and a water meter. Each of the double check valve assemblies shall meet the requirements of a double check valve assembly as stated in subsection I of this section.

(2) The purpose of a double-check detector-check valve assembly shall be to detect leaks within a plumbing system, and to detect points of unauthorized water use such as illegal taps.

(3) The following installation criteria shall apply for double-check detector-check valve installations in addition to those outlined in subsection I of this section:

a. Double-check detector-check valve assemblies shall not be installed on fire sprinkler systems which are chemically charged. Such systems require the installation of a reduced pressure principle device.

b. The physical construction of the entire assembly including the bypass shall not be modified in any fashion.

c. Only those water meters specified by the manufacturer shall be utilized in the device.

L. Device Testing Equipment.

(1) Reduced pressure principle backflow prevention devices shall be tested with a differential pressure gauge.

(2) Double check valve assemblies shall be tested with a duplex gauge (two independent pressure gauges with increments of at least two pounds per square inch (psi)), or may be tested by the sight tube method.

(3) Pressure vacuum breakers shall be tested with a differential pressure gauge.

(4) The acceptability of any testing gauge or apparatus shall be determined by the utility.

(5) Any testing gauge, apparatus or scientific instrument utilized for the testing of backflow prevention devices shall be in calibration. The utility may periodically require testing equipment to be checked for calibration at the utility meter shop.

M. Standard for Backflow Prevention Devices. Any backflow prevention device required herein shall be of a model and size approved by the Town Water Administrator of municipal utilities.

N. Test and Certification of Backflow Preventers. The following testing laboratory has been qualified by the director of municipal utilities to test and certify backflow preventers:

Foundation for Cross-Connection Control & Hydraulic Research  
University of Southern California  
BHE University Park, MC 0231  
Los Angeles, California 90089-0231

Testing laboratories other than the laboratory listed above will be added to an approved list as they are qualified by the Town Water Administrator of municipal utilities.

O. Approved Backflow Preventers. Backflow preventers which may be subjected to back pressure or back siphonage that have been fully tested and have been granted a certificate of approval by the qualified laboratory and are listed on the laboratory's current list of "approved devices," and which newly-installed devices have been inspected and installed to the satisfaction of the Town Water Administrator, shall be deemed in compliance with this chapter.

P. Existing Cross-Connection. Within a reasonable time following the adoption of this chapter, existing cross-connections between a public water system and any secondary water system shall be eliminated or protected by means of an approved backflow preventer. The following shall install devices within six months: sewage treatment plants, hospitals, mortuaries, and industrial establishments that manufacture materials that can exhibit health hazards. Other cross-connections shall be eliminated or protected within a time period as specified by the Town Water Administrator.

Q. Existing Devices. Backflow prevention devices having been installed and integrated into the municipal water system on or prior to January 1, 1986 shall be inspected and tested by a state certified tester in accordance with the standards of this chapter.

(1) Compliant Devices: Devices meeting the standards hereof which are found to be properly installed, or consistent with the degree of hazard, and are tested and certified to be in proper working condition, will thereafter be periodically tested and maintained by a certified tester in conformance with this chapter.

(2) Noncompliant Devices: Devices not meeting the standards hereof, installed incorrectly, or which are defective or not consistent with the degree of hazard shall be replaced with approved devices by a certified tester and thereafter shall be periodically tested and maintained by a certified tester in compliance with the standards set forth in this chapter.

R. Specific System Requirements.

(1) Irrigation Systems. The following guidelines relating to backflow prevention devices for irrigation systems shall apply:

a. Where a cross-connection hazard is determined to be exceptionally low, (a correctly installed residential sprinkler system with

a correctly installed atmospheric vacuum breaker, for example) a containment device may not be required by the Town Water Administrator.

b. Pressure vacuum breakers shall be installed at the beginning of each irrigation circuit and at a minimum of twelve inches above the highest irrigation head on the circuit. Individual irrigation circuits having quick coupling valves or other similar type heads that will permit pressure to be retained in the circuit shall have a pressure vacuum breaker installed as a minimum requirement for each circuit. Irrigation systems using the subsurface drip method shall have a pressure vacuum breaker on each circuit. A pressure vacuum breaker may not be installed where a double check valve assembly, reduced pressure principle backflow prevention device, or air gap separation is required.

c. A double check valve assembly may be installed to serve multiple irrigation circuits in lieu of vacuum breakers on each individual irrigation circuit.

d. A reduced pressure principle backflow preventer or air gap separation shall be required before any piping network in which nonpotable water, fertilizers, pesticides and other chemicals or toxic contaminants are injected or siphoned into the irrigation system.

## (2) Fire Systems.

a. Water systems for fighting fire, derived from a supply that cannot be approved as safe or potable for human use shall be kept wholly separate from drinking water pipelines and equipment. In cases where the city's water system is used for both drinking and fire fighting purposes, approved backflow prevention devices shall be installed to protect such individual drinking water lines as are not used for fire fighting purposes. It is declared that it is the responsibility of the person or persons causing the introduction of the unapproved or unsafe water into the pipelines to see (i) that a procedure be developed and carried out to notify and protect users of this piping system during the emergency; (ii) that special precautions be taken to disinfect thoroughly and flush out all pipelines which may have become contaminated before they are again used to furnish drinking water. In the event the means of protection of water consumers is by disinfection of the auxiliary fire fighting supply, the installation and its use shall be thoroughly reliable.

b. When disinfection of the auxiliary supply itself is depended upon to render the water safe, the means of applying the disinfectant under this regulation shall be automatic with operation of the pump or pumps employed with the dangerous water in question. Adequate supplies of chlorine or its compounds must be kept on hand at all times.

Chlorine dosing equipment shall be tested daily and kept in good operating condition.

c. The public water supply shall be protected against backflow from dual domestic fire systems by the installation of an approved air gap separation or an approved reduced pressure principle device where the hazard posed to the city water system is deemed by the director to be high; or by the installation of a double check valve assembly or double-check detector-check valve assembly where the hazard posed to the city water system is deemed by the director to be low.

SECTION 3 Compliance procedures. A. Installation of Required Devices.

(1) Upon completion of inspection of the premises, the Town Water Administrator shall notify the owner in writing what type of device will be required to protect the city water system and shall provide specific guidelines for the installation.

(2) The owner will be required to provide, at the owner's expense, the device and the plumbing/construction necessary for the device to be installed (device set). Such plumbing/construction will be required to meet all provisions set forth in Section 2 and must be approved by the utility.

B. Compliance Required.

(1) The utility will take necessary action to ensure compliance with the Colorado Department of Health, Primary Drinking Water Regulations, Section 11.1.2, and the Colorado Revised Statutes, 25-1-114 (1973).

(2) The owner of the premises is required to permit entry to the premises for inspection, testing and maintenance purposes at reasonable times. Failure to permit entry to the premises will result in the premises being regarded as a high hazard, and a reduced pressure principle device will be required to protect the city's water system.

(3) The owner is required to provide all necessary plumbing/construction needed for the installation of the device. Failure to provide such required plumbing/construction will result in action being taken as provided for in Section 2.

SECTION 4 Violations and penalties. A. The Town Water Administrator shall notify the owner or authorized agent of the owner, of the building or premises in which there is found a violation(s) of these regulations. The Town Water Administrator shall set a specific time for the owner to have

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the violation removed or corrected. If the owner fails to correct the violation(s) in the specific time, the Town Water Administrator may, if in his/her judgment an imminent health hazard exists, suspend water service to the building or premise. Additional fines or penalties may also be invoked following suspension of service.

B. Anyone who knowingly or wilfully violates the provisions of this chapter, upon conviction shall be required to pay a fine of not more than three hundred dollars or be imprisoned in jail for a period of time not to exceed ninety days, or both such fine and imprisonment.

The Board of Trustees finds and determines that this ordinance is necessary for the immediate preservation of the public peace, health and safety and, therefore, an emergency exists and that this ordinance shall become effective five days after publication thereof.

PASSED, ADOPTED AND ORDERED PUBLISHED THIS 27 DAY OF April, 1989.

Ray J. Kenhurst  
Mayor

(SEAL)

ATTEST:

Jackie L. Garrett  
Town Clerk

STATE OF COLORADO )  
 )  
 County of Kit Carson ) ss. CLERK'S CERTIFICATE  
 )  
 Town of Stratton )

That I, Jackie Garrett, the official Town Clerk of the Town of Stratton, do by these presents say that the foregoing Ordinance No. 47A was passed by a majority of the members of the Board of Trustees and adopted by the Board of Trustees of the Town of Stratton on the 27<sup>th</sup> day of April, A.D., 1989, and that the above entitled Ordinance is a true, correct and full copy of the Ordinance as shown in the records of the Town of Stratton, Stratton, Colorado.

Dated this 1<sup>st</sup> day of May, 19 89.

Jackie L. Garrett  
 Town Clerk

STATE OF COLORADO )  
 )  
 County of Kit Carson ) ss. CLERK'S CERTIFICATE OF PUBLICATION  
 )  
 Town of Stratton )

I, Jackie Garrett, the official Town Clerk of the Town of Stratton, do by these presents say that the foregoing Ordinance No. 47A and Clerk's Certificate attached thereto was published in the Stratton Spotlight, a weekly newspaper of general circulation in Stratton, Kit Carson County, Colorado, on May 4, 1989, and "Proof of Publication" is filed therewith.

Jackie L. Garrett  
 Town Clerk