

2012; WATERMAINS
SPECIFICATIONS FOR CROSS CONNECTIONS and BACKFLOW PREVENTION
SECTION

1. General

- 1.1. Background: The United States Congress enacted the Safe Drinking Water act (PL 93-532) into law on December 16, 1974. Minnesota achieved primacy for the Safe Drinking Water Act in 1976. Minnesota State Statutes place responsibility for compliance with the Safe Drinking Water Act on the water purveyor through the Department of Health. The Safe Drinking Water Act and its regulations cover all potable water systems and states that "minimum" protection should include programs that result in the prevention of health hazards, such as cross connections."
- 1.2. Purpose: The purpose of this specification is:
- 1.2.1. To carry out the requirements of the Safe Drinking Water Act (PL 93-532) and the Minnesota Department of Health chapters 4720 and 4715.
- 1.2.2. To protect the municipal potable water supply of _____, Minnesota from the possibility of contamination or pollution of the potable water system(s) under the direct authority of the _____ Public Utilities.
- 1.2.3. To promote the elimination or control of existing cross connections, actual or potential, between the customer's potable water system(s) and another environment containing substance(s).
- 1.2.4. To provide for the maintenance of a continuing Program of Cross Connection Control which will systematically and effectively prevent the contamination or pollution of all potable water system(s) under the direct authority of the _____ Public Utilities.
- 1.3. Responsibility: The _____ Public Utilities at _____ Street, _____, Minnesota shall be responsible for the protection of the potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants. If, in the judgment of _____ an approved means of backflow prevention is required (in the customer's water service; or within the customer's private water system) for the safety of the water system, the _____ Public Utilities shall give notice in writing to said customer to install an approved means of backflow prevention at a specific location(s) on the customer's premises. The customer shall immediately install an approved means of backflow prevention at the customer's own expense; failure, refusal or inability on the part of the customer to install, have tested, maintain or repair such, shall constitute grounds for disconnecting water service to the premises until such requirements have been satisfactorily met.
- 1.3.1. _____ Public Utilities, the authority having jurisdiction in charge of the "municipal" water system is vested with authority and responsibility for the implementation of an effective cross connection control program and for the enforcement of the provisions of this specification

2. Definitions: The following definitions shall apply to this specification. These definitions shall be used in conjunction with definitions and guidelines of the Minnesota Plumbing Code “Chapter 4715, Definitions and Standards”.
 - 2.1. Approved
 - 2.1.1 The term “approved” as herein used in reference to a water supply shall mean a water supply that has been approved by the Minnesota Department of Health.
 - 2.1.2. The term “approved” as herein used in reference to an air gap, pressure vacuum breaker assembly, a double check valve assembly, a reduced pressure principle backflow prevention assembly or other backflow prevention assemblies, devices or methods shall mean any such assembly, device or method approved by the State of Minnesota Plumbing Code, Department of Health and the _____ Public Utilities.
 - 2.2. Auxiliary Water Supply: Any water supply on or available to the premises other than the water supply of the _____ Public Utilities will be considered as an auxiliary water supply. These auxiliary waters may include water from another city’s water utility or public potable water supply or any natural source(s) such as a well, spring, river, stream, harbor, etc., or used water of industrial fluids. These waters may be contaminated or polluted or they may be objectionable and constitute an unacceptable water source over which the _____ does not have sanitary control.
 - 2.3. Backflow: The term “backflow” shall mean the undesirable reversal of flow of water or mixtures of water and other liquids, gases or other substances into the distribution pipes of the potable supply of water from any source(s).
 - 2.4. Backpressure: The term “backpressure” shall mean any elevation of pressure in the downstream piping system (i.e. pump, elevation of piping, or steam and/or air pressure) above the supply pressure at the point of consideration, which would cause, or tend to cause, a reversal of the normal direction of flow.
 - 2.5. Backsiphonage: The term “backsiphonage” shall mean a form of backflow due to a reduction in system pressure, which causes a sub atmospheric pressure to exist at a site in the water system.
 - 2.6. Backflow Preventer: A means designed to prevent backflow.
 - 2.6.1. Air Gap: The term “air gap” shall mean a physical separation between the free flowing discharge end of a potable water supply pipeline and an open and non-pressure receiving vessel.
 - 2.6.2. Approved Air Gap: Shall be at least double the diameter of the supply pipe measured vertically above the flood level rim of the fixture, but in no case less than 1 inch.
 - 2.6.3. Reduced Pressure Principle Backflow Prevention Assembly: The term “reduced pressure backflow assembly” shall mean an assembly containing two (2) independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located

between the check valves and at the same time below the first check valve. The unit shall include properly located resilient seated test cocks and tightly closing resilient shutoff valves at each end of the assembly. This assembly is used to protect against a non-health (i.e., pollutant) or a health hazard (i.e., contaminant).

- 2.6.4. Double Check Valve Backflow Prevention Assembly: The term “double check valve backflow prevention assembly” shall mean an assembly composed of two (2) independently acting approved check valves, including tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly shall only be used to protect against a non-health hazard (i.e., pollutant).
- 2.6.5. Pressure Vacuum Breaker (PVB): The term “pressure vacuum breaker assembly” means an assembly which consists of an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve, with properly located resilient seated test cocks and tightly closing resilient seated shutoff valves attached at each end of the assembly.
- 2.6.6. Backsiphonage Backflow Vacuum Breaker (SVB): The term “backsiphonage backflow vacuum breaker” shall mean a type of cross connection control assembly which contains a check valve force – loaded closed and an air inlet vent valve force - loaded open to the atmosphere, positioned downstream of the check valve, and located between and including two (2) tightly closing shutoff valves and two (2) test cocks.
- 2.6.7. Atmospheric Vacuum Breaker (AVB): The term “atmospheric vacuum breaker” means a device that performs similarly to a pressure vacuum breaker assembly. The AVB consists of a float check, a check seat, and an air inlet port. During normal flow conditions the float within the AVB seals against the air inlet seat. When a backsiphonage condition develops the cessation of normal flow permits the float to drop, thus opening the air inlet valve. If the float seals against a check seat there is no backsiphonage from the AVB body or downstream piping. However, if the float check is fouled, the air entering through the air inlet valve dissipates.
- 2.7. Contamination: The term “contamination” shall mean an impairment of the quality of the water creating an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, waste, or toxic solutions.
- 2.8. Cross Connection: The term “cross connection” shall mean any unprotected actual or potential connection or structural arrangement between a municipal or a consumers private potable water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gases, solids or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which or because of which backflow can or may occur are considered to be cross connections.
- 2.8.1. The term “direct cross connection” shall mean a cross connection which is subject to both backsiphonage and backpressure.

- 2.8.2. The term “indirect cross connection” shall mean a cross connection which is subject to backsiphonage only.
- 2.9. Controlled Cross Connections: A connection between a potable water system and a non-potable water system with an approved means of backflow prevention properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.
- 2.10. Containment - Potable Water Service Protection: The term “containment or water service protection” shall mean the appropriate type or method of backflow protection in the water service commensurate with the degree of hazard of the customer’s water system. (See also Isolation)
- 2.11. Customer: The term “customer” shall mean the owner (i.e., building or property owner) of the water system(s) supplied by the _____ Public Utilities.
- 2.12. Degree of Hazard: The term “degree of hazard” shall mean either a polluttional (non-health) or contamination (health) hazard and is derived from the elevation of conditions within a system.
- 2.12.1. Health Hazard: The term “health hazard” shall mean an actual or potential threat of contamination of a physical or toxic nature to the public potable water system of the customer’s potable water system that would be a danger to health (i.e., contamination).
- 2.12.2. Plumbing Hazard: The term “plumbing hazard” shall mean an internal or plumbing type cross connection in a customer’s potable water system that may be either a polluttional or a contamination type hazard. This includes but is not limited to cross connections in toilets, sinks, lavatories, wash trays and lawn irrigation systems. Plumbing type cross connections can be located in many types of structures including homes, apartment houses, hotels, commercial and industrial establishments. Such a connection, if permitted to exist, must be properly protected by an appropriate means of backflow prevention.
- 2.12.3. Non-Health Hazard: The term “non-health hazard” shall mean an actual or potential threat to the physical properties of the water system or the portability of the public or the customer’s potable water system but which would not constitute a health or system hazard, as defined. The maximum degree or intensity of pollution to which the potable water system could be degraded under this definition would cause a nuisance, be aesthetically objectionable or could cause minor damage to the system or its appurtenances (added parts).
- 2.12.4. System Hazard: The term “system hazard” shall mean an actual or potential threat of severe damage to the physical properties of the water system (public or customer’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.
- 2.13. Industrial Fluids: The term “industrial fluids” shall mean any fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration which would constitute a health, system, non-health or plumbing hazard if

introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated used waters, all types of process waters and “used waters” originating from the public potable water system which may deteriorate in sanitary quality, chemicals in fluid form, plating acids and alkali’s, circulating cooling treated or stabilized with toxic substances, contaminated natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc., oils, gases, glycerin, paraffin’s, caustic and acid solutions or other liquid and gaseous fluids used industrially for other purposes including fire fighting purposes.

- 2.14. Isolation - Point of Use: The term “isolation or point of use” shall mean the appropriate type or method of backflow protection at all potable water outlets commensurate with the degree of hazard to the customer’s potable water system.
- 2.15. Non-Potable Water: The term non-potable water” means water not safe for drinking, personal or culinary use.
- 2.16. Pollution: The term “pollution” shall mean an impairment of the quality of the water to a degree which does not create a hazard to the public health but which does adversely and unreasonably effect the aesthetic qualities of such waters for human use or consumption.
- 2.17. Potable Water: The term “potable water” means water that is: safe for human consumption, personal or culinary use; and free from impurities in amounts sufficient to cause disease or harmful physiological effects.
- 2.18. Rebuild: The term “rebuild” when used in reference to a Reduced Pressure Principle (RPZ) backflow prevention assembly shall consist of replacing all of the spring and rubber parts within the device. Both spring and rubber repair kits are required.
- 2.19. Water User: The term “water user” shall mean the person(s) that will be consuming or using the water at the point of use, (i.e., consumer).
- 2.20. State of Minnesota, Department of Health, (Minnesota Plumbing Code), Chapters 4715 and 326 shall apply to all aspects of this specification.
- 2.21. System Drain: A hose bibb or boiler cock that is used exclusively to blow out or drain a water system for frost conditions or maintenance.

3. Requirements

3.1. Policy

3.1.1. No water service to any premise shall be allowed by the _____ Public Utilities unless the water supply is protected as required by the State of Minnesota Department of Health, Chapters 4720 and 4715, State Statutes and Regulations, _____ Watermain Material and Installation Specifications, AWWA Manual M14 and City ordinances. Service of water to any premise shall be discontinued by the _____ Public Utilities if the means of backflow prevention required by this specification is not installed, tested, maintained and repaired, or if it is found that a means of backflow prevention has been removed, bypassed, or if an unprotected cross

connection exists on the premises. Service will not be restored until such conditions or defects are corrected.

- 3.1.2. The customer's system shall be open for inspection at all reasonable times to authorized representatives of the _____ Public Utilities to determine whether unprotected cross connections or other structural or sanitary hazards, including violations of these regulations exist. When such a condition becomes known, the _____ Public Utilities shall immediately notify the customer of the violation, ensure that corrective action is taken in a punctual manner or shall deny or immediately discontinue water service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with Minnesota Law and this specification.
- 3.1.3. It shall be the responsibility of the customer to assume the cost for the installation, testing, repair and maintenance of the backflow assembly as required by these Specifications and all other referenced materials. An accredited tester approved by the _____ Public Utilities shall perform these tests.

3.2. Water System

- 3.2.1. The water system shall be considered as made up of two (2) parts: The _____ Public Utilities System and the customer's water system.
- 3.2.2. The _____ Public Utilities water system shall consist of the source of the water, the facilities and distribution system; and shall also include all those facilities of the water system under the control of the _____ Public Utilities.
- 3.2.3. The source shall include all components of the facilities utilized in the production, treatment, storage and delivery of water to the distribution System.
- 3.2.4. The distribution system shall include the network of conduits used from the source to the customer's system.
- 3.2.5. The customer's system shall include those parts of the facilities beyond the termination of _____'s distribution system, which are utilized in conveying potable water to points of use.

3.3. Special Backflow Assembly Requirements

- 3.3.1. An approved means of backflow prevention shall be installed on each service line to a customer's water system at or near the property line or immediately inside the building being served; but in all cases, before the first branch line leading off the service line whenever the following conditions exist:
 - 3.3.1.1. 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 State of Minnesota Department of Health, _____'s water system shall be protected against backflow

from the premises by installing an approved means of backflow prevention in the service line commensurate with the degree of hazard.

3.3.1.2. 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 _____'s water system, _____'s water system shall be protected against backflow from the premises by installing an approved means of backflow prevention in the service line commensurate with the degree of hazard. This shall include the handling of process waters and waters originating from _____'s distribution system which have been subject to deterioration in quality.

3.3.1.3. In the case of premises having either internal cross connections that cannot be corrected and protected, or intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes thereby making it impractical or impossible to ascertain whether dangerous cross connections exist, _____'s water system shall be protected against backflow from the premises by installing an approved means of backflow prevention in the service line.

3.3.2. The type of protective backflow prevention assembly required shall depend upon the degree of hazard which exists as defined below:

3.3.2.1. In the case of any premise where there is an auxiliary water supply not subject to the following rules, _____'s water system shall be protected by an approved air gap or an approved reduced pressure principle backflow prevention assembly.

3.3.2.2. In the case of any premise where there is water or substance that would be objectionable but not hazardous to health if introduced into _____'s water system, an approved double check valve backflow prevention assembly shall protect _____'s water system.

3.3.2.3. In the case of any premise where there is any material dangerous to health, which is handled in such a fashion as to create an actual or potential hazard to _____'s water system, _____'s water system shall be protected by an approved air gap or an approved reduced pressure principle backflow prevention assembly. Examples of premises where these conditions will exist include, but are not limited to sewage treatment plants, sewage pumping stations, chemical manufacturing plants, hospitals, health care facilities (i.e.; clinics, medical centers, health centers, nursing homes, etc.) mortuaries, plating plants, agricultural facilities (i.e.; farms), chemical or fertilizer plants, etc.

3.3.2.4. In the case of any premise having multiple violations where there has been unprotected cross connections, either actual or potential, and/or where there are a number of plumbing or piping changes occurring, _____'s water system shall be protected by an approved air gap or an approved reduced pressure principle backflow assembly at the service connection directly off of the main ahead of all customer connections.

- 3.3.2.5. In the case of any premise where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete on-premise cross connection survey, either an approved air gap or an approved reduced pressure principle backflow assembly on each service to the premises shall protect _____'s water system.
- 3.3.2.6. Means of backflow prevention application will be determined by the degree of hazard in the following chart and, but not limited to: State of Minnesota Department of Health Chapter 4715: See section 2.12. for definitions relating to “ Hazards”.

DEGREE OF HAZARD CHART

Method Assemblies or Devices	Pollution (Low Hazard)		Contamination (High Hazard)		Installation
	Backsiphonage	Back Pressure	Backsiphonage	Back Pressure	
Air Gap (Method)	X		X		ANSI (A112.1.2)
Atmospheric Vacuum Breaker (Device) (ASSE 1001)	X		X		Upright position. No valves downstream. Minimum of 6 inches or listed downstream piping and flood level rim of receptor. See special requirements in Minnesota Plumbing Code. Maximum of 8 hrs continuous line pressure permitted.
Double Check Valve Backflow Preventer Assembly (ASSE 1048)	X	X			Requires clearance for testing, repair and maintenance. Readily accessible.
Double Check Valve with Intermediate Atmospheric Vent (Device) (ASSE 1012)	X	X	See special Requirements in Minnesota Plumbing Code	See special Requirements in Minnesota Plumbing Code.	Readily accessible (See special requirements in MN Plumbing Code.)
Pressure Vacuum Breaker (Assembly) (ASSE 1020)	X		X		Upright position. May have valves downstream. Minimum of 12 inches above all downstream piping and flood level rim of receptor continuous line pressure permitted.
Reduced Pressure Principle Backflow Prevention Assembly (ASSE 1013)	X	X	X	X	Horizontal unless otherwise listed. Readily accessible. Requires clearance for test, repair & maintenance
SVB Backsiphonage Backflow Assembly (ASSE 1056)	X		X		Same as Pressure Vacuum Breaker

3.3.2.7. All presently installed backflow prevention assemblies which do not meet the requirements of these specifications but were approved backflow protection for the purposes described herein at the time of installation and which have been properly tested, repaired and maintained, shall except for the testing, repair and maintenance requirements under subsection 3.4., be excluded from the requirements of these rules, so long as the _____ Public Utilities is assured that they will satisfactorily protect the potable water systems. Whenever the existing backflow preventer is moved from the present location or requires more than minimum maintenance or when the _____ Public Utilities finds that the installation constitutes a hazard to health, the backflow preventer shall be replaced by an approved means of backflow prevention meeting the requirements of these specifications.

3.3.2.8. Any means of backflow prevention required herein shall mean an assembly that has been manufactured in full conformance with the standards established by American Water Works Association (AWWA) and by American Society of Sanitary Engineering (ASSE) and have met completely the laboratory and field performance specifications of the Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California (USC FCCCHR) established in: Specifications of Backflow Prevention Assemblies - Section 10 of the most current Edition of the Manual of Cross Connection Control.

3.3.2.9. The _____ Public Utilities has adopted said AWWA/ASSE and USC FCCCHR Standards and Specifications. A “Certificate of Compliance” for the said AWWA/ASSE standards shall evidence Final approval; or “Certificate of Approval” for the said USC FCCCHR specifications issued by an approved testing laboratory.

3.3.3. It shall be the responsibility of the customer to label all system drains that have threaded connections with the words “DRAIN ONLY”. The tags or labels must be waterproof and have legible letters at least 1” in height.

3.4. Customer Responsibilities

3.4.1. It shall be the duty of the customer at any premise where backflow prevention assemblies are installed to have a field test performed by an accredited backflow prevention assembly tester upon installation and at the required annual intervals thereafter. The _____ Public Utilities may require field tests at more frequent intervals as individual circumstances may indicate.

3.4.2. It shall be the responsibility of the customer to assume the cost for the installation, testing, repair and maintenance of the backflow assembly. An accredited tester approved by the _____ Public Utilities shall perform these tests.

3.4.3. The water customer may be required to notify the _____ Public Utilities in advance when tests are to be undertaken so that a _____ Public Utilities representative may witness the field

tests, if so desired. The water customer would be informed, in advance, if such action were to occur. If notification is requested and not provided, the _____ Public Utilities may require retesting of the assembly.

3.5. Testing and Maintenance

- 3.5.1. All backflow assemblies must be tested upon installation, at the required annual intervals thereafter per State of Minnesota Plumbing Code and/or the manufactures minimum recommended interval. The _____ Public Utilities may require field tests at more frequent intervals as individual circumstances may indicate (i.e.; high hazards, high incidence of field test failures, frequent internal plumbing changes, etc.)
- 3.5.2. The Owner is required to have all testable backflow prevention assemblies tested at intervals not to exceed twelve (12) months from the date of the previous test date and shall be submitted to the _____ Engineering Department no more than 30 days after the test date.

The Owner is required to have any Reduced Pressure Principle (RPZ) backflow prevention assemblies rebuilt at intervals not to exceed five (5) years. The rebuild must be completed by a licensed plumber per State of Minnesota Plumbing Code. See section 2.18. for the definition of a rebuild.

- 3.5.3. The _____ Public Utilities will notify in writing each water customer that is delinquent in submitting their annual backflow prevention assembly tests. This written notice shall give the water customer a maximum of 30 calendar days to have the assembly tested and submitted.
- 3.5.4. A “Second Notice” shall be sent to each water customer who does not have the backflow prevention assembly tested as prescribed in the first written notice within the 30 calendar day period allowed. The “Second Notice” will give the water customer a period of 15 calendar days to have the assembly tested and the completed report submitted. A fee as prescribed in the _____ Policy Manual shall apply to all instances where a second notice is sent. *See Figure 3.5.4. for an explanation of _____ Policy Fee Structure.
- 3.5.5. If the water customer takes no action within the 15 calendar day grace period, the _____ Public Utilities may terminate water supply to the water customer until the said assembly is tested. The water customer will be subject to fees if it is necessary to terminate the water service and reinstate the service.
- 3.5.6. All tests must be performed by an accredited backflow tester and reports completed and submitted on the proper form to: _____
Public Utilities, ATTN: Cross Connection Control, _____,
_____, MN _____
- 3.5.7. The _____ Public Utilities, the company or tester doing the testing and the water customer shall keep records of tests, repairs and maintenance. The _____ Public Utilities and the water

customer shall maintain these records for a minimum of seven (7) years and make them available upon request.

***Figure 3.5.4. Explanation of _____ Policy Fee Structure**

If the customer fails to comply with section 3.5.3. in year 1 (i.e. first offense) the “Second Notice” fee shall be \$50. If in year 2 or any subsequent year after being issued a \$50 fee for non-compliance to section 3.5.4. then the fee shall be increase to \$100 and remain at that rate for all future occurrences.

3.6. Requirements for _____ Approval of Backflow Prevention Assembly Testers

3.6.1. Accredited backflow prevention assembly testers shall be approved by the State of Minnesota Department of Labor and Industry and the _____ Public Utilities. Competency in all phases of backflow prevention assembly testing must be demonstrated by means of education and experience. To be accredited by _____ the potential tester must submit the following minimum requirements and after review of the material be added to the official list of backflow prevention assembly testers prior to completing any work with in the city limits of _____.

3.6.2. The following are minimum requirements:

3.6.2.1. Testers shall have a completed a minimum amount of training as required in a cross connection control tester course approved by the State of Minnesota Department of Labor and Industry.

3.6.2.2. Testers shall hold a valid accreditation from the State of Minnesota Department of Labor and Industry.

3.6.2.3. The tester of backflow prevention assemblies shall furnish evidence to show that he/she has available the necessary tools and equipment to properly test such assemblies.

3.6.2.4. The tester shall be responsible for the accuracy and calibration (annual requirement) of the test equipment and the competency and accuracy of all tests and reports prepared by him/her. The test equipment shall be calibrated by an accredited laboratory in accordance with the recognized International Standard ISO/IEC 17025.

3.6.2.5. Maintenance and repair work on backflow prevention devices will have to be performed by a licensed master plumber, or licensed journeyman plumber under the supervision of a master plumber (MN Statute 326.40) in addition to being an accredited backflow prevention assembly tester.

3.6.2.6. (Exception) An accredited backflow preventer assembly tester approved by the State of Minnesota Department of Labor and Industry and accredited by the _____ Public Utilities may test, maintain, repair and replace Pressure Vacuum Breakers (PVB) assemblies on irrigation systems ONLY.

3.7. On-Premise Cross Connection Control Survey/Inspection

3.7.1. The _____ Public Utilities shall require an on-premise survey to evaluate cross connection hazards, as per these specifications.

3.7.2. The _____ Public Utilities shall provide written notice of the survey to the water customer and collectively determine a date and time acceptable to both to conduct the survey.

3.7.3. The _____ Public Utilities and the water customer shall be notified of the survey findings, listing the degree of hazard and the corrective actions to be taken, if any are required. A reasonable period of time shall be given to complete all backflow prevention. Documentation of completion of corrective actions/changes must be provided to the _____ Public Utilities.

3.7.4. The _____ Public Utilities shall, at its discretion, may require a re-inspection for cross connection control hazards of any premise to which it serves water because of re-piping, plumbing remodeling or additions to existing piping for reasons that may permit a hazard to the potable water system(s).

3.8. Commercial Fire Protection System Requirements

3.8.1. All new installations shall require double check valves. All systems with a single check valve that are being replaced shall be upgraded to a double check valve.

3.8.2. Existing single check valves that are in place may remain in place as long as no work is being completed to the device or the immediate area adjacent to the device.

3.8.2.1. If an additional riser is added to the header or if a riser, previously installed for future use is utilized, it will be construed as work being done to the area adjacent to the device.

3.8.2.2. Before installing or testing a backflow prevention assembly on a fire sprinkler system, it is required that the fire authority having jurisdiction be consulted for additional criteria they may require. Additionally, the hydraulic calculations for the fire sprinkler system shall be recalculated adding the additional pressure loss of the new back flow device proposed to be installed. The hydraulic calculations shall be submitted to the _____ Fire Department for approval before the backflow prevention device is installed.

3.8.2.3. Before testing or performing maintenance on a backflow prevention device for a fire sprinkler system, all proper notifications shall be made. Each system will have different requirements, contact the _____ Fire Department with questions.

3.8.2.4. Exceptions may be made in cases where the replacement of a single check valve with a double check backflow device on existing systems reduces the flow to a point that the system no longer complies with fire codes or insurance requirements and the addition of a booster pump or fire pump is not structurally practical.

3.9. Residential Fire Protection System Requirements

3.9.1. The following applies to residential fire systems that are constructed of approved potable materials and are designed to flow water so it does not become stagnate. The conditions found in the NFPA 13d section 8.4.3.3 must be met.

3.9.1.1. If a residential sprinkler system installed in a single family dwelling is constructed with potable water pipe and there are no chemicals in the system, a backflow device is not required.

3.9.1.2. If the system is constructed with non-potable materials and there are no chemicals in the system, a double check valve is required. Annual testing is required.

3.9.1.3. If the system is constructed with any chemicals contained within it, an RPZ is required. Annual testing and rebuilds at intervals not to exceed 5 years is required.

3.9.2. The following applies to a Multi-purpose residential fire system in a single family dwelling. This system has dead end runs that permit water to become stagnate.

3.9.2.1. If the system is constructed with potable water pipe and there are no chemicals in the system, a single check valve is required. Annual testing is not required.

3.9.2.2. If the system is constructed with non-potable materials and there are no chemicals in the system, a double check valve is required. Annual testing is required.

3.9.2.3. If the system is constructed with any chemicals contained within it, an RPZ is required. Annual testing and rebuilds at intervals not to exceed 5 years is required.

3.9.3. Residential fire sprinkler systems shall be installed on the customer side of the water meter.

3.9.4. Residential fire sprinkler systems that have non-potable materials shall be labeled with stickers that read “non-potable water” a minimum of every 5 feet and orientated to be in conspicuous locations.

3.9.5. It is the fire sprinkler system designers responsibility to provide _____ with the water flow requirements of the meter to meet their system needs. _____ will size the meter to meet these requirements if possible. _____ will only supply a water meter above 1” if special circumstances exist and a request is made from the owner.

3.9.6. All fire sprinkler systems must be reviewed and approved by the _____ Fire Department.

3.10. In-ground Irrigation Systems

3.10.1. The State of Minnesota requires backflow protection on all in-ground irrigation systems. The testing of all irrigation system protection devices must be completed each year at the time of system start-up. This is due to the nature of the system being taking in/out of service to protect it from our local climate.

4. Penalty

4.1. A financial penalty shall be charged as outlined in the _____ Policy Manual for any failures to perform the requirements of these Specifications. The penalty shall be billed directly back to the monthly service fees for the service that is in violation.

4.2. The _____ Public Utilities may terminate water supply to the water customer for any failures to perform the requirements of these Specifications. The water customer will be subject to fees as outlined in the _____ Policy Manual for the reestablishment of water service to the customer.