THE COMMISSIONERS OF PUBLIC WORKS

OF THE CITY OF GREENVILLE, S.C.

CROSS CONNECTION CONTROL MANUAL

INTRODUCTION

The Commissioners of Public Works of the City of Greenville, South Carolina have established an ongoing Cross Connection Control Program. This program was begun in 1968 to comply with safe drinking water standards. The goal of this program is "to protect the potable water supply from contamination due to the occurrence of backflow into the system."

This manual of policies and procedures is part of the policy of cross connection control adopted by the Commissioners of Public Works on September 6th, 2022. The techniques to be used to prevent backflow shall be a joint effort of the Commissioners of Public Works, The City of Greenville, Greenville County, the South Carolina Department of Health and Environmental Control, and the customers of the Greenville Water.

The primary method of cross connection control shall be by a backflow prevention device on the customer's service line. Most commercial, industrial, irrigation (as noted), and private fire protection customers will be required to install, maintain, and test the backflow prevention assembly on their service line. Most existing customers currently have a backflow prevention assembly installed.

Due to periodic changes in drinking water regulations, this manual of Cross Connection Control is subject to changes without notice to comply with these regulations. The customer is responsible for periodically obtaining the most current updated copies of the manual. Current copies of this manual can be obtained from the Engineering Department of Greenville Water or online at www.greenvillewater.com. Questions regarding this manual should be directed to the Cross Connection Control Department at (864) 241-6100.

Purpose

The Commission of Public Works of the City of Greenville, South Carolina, known as Greenville Water, have established a program of Cross Connection Control to protect and maintain Greenville Water's potable water supply from potential hazards to the health of customers due to backflow into Greenville Water by cross connection through the following procedures;

A. Eliminating or controlling existing unprotected cross connections between Greenville Water's distribution system and any piping or water system; and

B. Establishing and maintaining regulations and standards in accordance with regulations and accepted practices promulgated by South Carolina Department of Health & Environmental Control, American Water Works Association, Federal, and Local Agencies.

Authority

Authority includes the Federal Safe Drinking Water Act of 1996, the State Safe Drinking Water Act (1976 Code of Laws of South Carolina, Section 44-55-10, et seq.) and the South Carolina Department of Health & Environmental Control and the Plumbing Code adopted by the City and County of Greenville, S.C. The invalidity of any provision(s) in this policy or manual of Cross Connection Control shall not affect the validity of any other provisions or applications which can be given effect without such invalid provision(s) or application(s).

Responsibility

A. Greenville Water has the primary responsibility for the protection of the potable water distribution system from potential hazards to the health of the customers by backflow from cross connections. Greenville Water shall evaluate connections to the potable water distribution system for cross connections and the customer shall provide and maintain backflow prevention assemblies commensurate with the degree of hazard for each connection. Greenville Water is not obligated to provide water service to unprotected cross connections.

B. The Customer shall have the responsibility of preventing backflow from entering the customer's water system, and from entering Greenville Water's distribution system. The customer shall install, maintain and test all backflow prevention assemblies, as necessary, according to all codes, Federal, State, Greenville Water and local backflow prevention practices.

Administration

A. Greenville Water shall operate a Cross Connection Control Program in accordance with the South Carolina Department of Health & Environmental Control laws and regulations to consist of, but not limited to, conducting on-site inspections, interviews, issuing permits, reviewing of plans, consulting local and state plumbing officials, maintaining files with pertinent customer information, and notifying customers of required periodic testing.

B. It is unlawful to install, permit to be installed or maintain any unprotected cross connections. Customers who install or maintain service connections to Greenville Water that are unprotected or fail or refuse to install protective devices or to test backflow prevention assemblies as directed by Greenville Water shall be notified by mail and Greenville Water will disconnect the service connection until corrections or tests are approved by Greenville Water. All applicable disconnect and reconnect fees shall be paid by the customer.

Approved and Adopted by the Commission this 6th day of September, 2022.

Witnesses

Kimberly Hawkes

Greenville Water

David H. Bereskin
Chief Executive Officer

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SECTION 1

DEFINITIONS

APPROVED

Accepted by GW as meeting the applicable specification stated or cited in this policy or as suitable for the proposed use.

AUXILIARY WATER SUPPLY

Any water supply on or available to the customers' premises other than the GW approved water supply. Auxiliary water supplies may include water from other water purveyors public potable water systems, or any natural source(s), such as well, spring, river, stream, harbor, etc., used waters, or industrial fluids.

BACKFLOW

The reversal of flow in a water distribution system as a result of back pressure or back siphonage.

BACK PRESSURE

A pressure, higher than the supply pressure, caused by a pump, elevated tank, elevated piping system, boiler, or any other means that may cause pressures greater than the public water supply.

BACK SIPHONAGE

Backflow caused by negative or reduced pressures in the supply piping. Decreases in pressures in the public water supply piping are usually the result of increased supply demands, such as fire fighting, water main breaks, or loss of pressures due to water mains being shut off for maintenance.

BACKFLOW PREVENTION ASSEMBLY

An assembly or means designed and approved to prevent backflow.

(1) AIR GAP

The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, plumbing fixture, receptor, and the flood rim of the receptacle. The air gap shall be at least twice the diameter of the water supply outlet above the flood rim of the receptacle, and never less than one inch.

(2) REDUCED PRESSURE PRINCIPLE ASSEMBLY (RP)

An assembly consisting of two independently acting spring assisted check valves with a hydraulically operating differential relief valve between the check valves and beneath the first check valve. The unit shall have properly located resilient seated test cocks, and resilient seated, or ball type shut off valves at each end of the assembly. This assembly shall be readily accessible for in-line testing and maintenance in a location that is never subject to possible flooding. This assembly is approved for high hazard category cross connections. This assembly shall require approval of SCDHEC and GW.

(3) DOUBLE CHECK VALVE ASSEMBLY (DCVA)

An assembly of two independently operating spring assisted check valves with properly located resilient seated test cocks and resilient seated or ball type shut off valves at each end of the assembly. This device shall be readily accessible for in-line testing and maintenance. This assembly is approved for low hazard category cross connections. This assembly shall require approval of SCDHEC and GW.

(4) DOUBLE DETECTOR CHECK ASSEMBLY

A specially designed and approved main line double check valve assembly with a small by-pass line that includes a double check valve assembly and a meter to detect leakage or unauthorized use of water on fire lines.

(5) RESIDENTIAL DUAL CHECK

An assembly of two independently operating spring assisted check valves. This assembly is not equipped with shut off valves or test cocks. This assembly is used for selectively approved low hazard category cross connections.

CERTIFIED TESTER

Any person successfully completing the SCDHEC training and certification seminar and possessing an up to date SCDHEC tester certification card and approved testing equipment.

CONTAMINATION

An impairment of the potable water quality by physical, chemical, biological, or radiological substance or matter which creates an actual health hazard.

CROSS CONNECTION

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

CROSS CONNECTION CONTROL BY CONTAINMENT

Installation of an approved backflow prevention assembly at the water service connection to any customer's premises. This is usually immediately down stream of the meter.

CROSS CONNECTION CONTROL MANUAL (CCCM)

The latest edition of the GW CCCM on backflow prevention. Up to date copies are available in the GW Engineering Department.

CUSTOMER

Any person or premise that receives water from GW.

DEGREE OF HAZARD

Determination of the potential risk to public health, and adverse effects upon the potable water system. This risk is defined below in two categories:

(1) HIGH HAZARD

An existing or potential threat to the public water supply of a physical or toxic nature that would be a danger to public health.

(2) LOW HAZARD

A hazard that does not constitute a threat to health, but may cause an actual or potential threat to the physical properties of the water and cause a nuisance or be aesthetically objectionable.

FLOOD LEVEL RIM

The level from which liquid in plumbing fixtures, appliances, or vats could overflow to the floor, when all drain and overflow openings built into the equipment are obstructed.

GREENVILLE WATER (GW)

GW consists of the Commissioners of Public Works of the City of Greenville, South Carolina, employees of GW, and designated representatives of GW.

GW CCCC

Greenville Water Cross Connection Control Coordinator.

HEALTH OFFICIAL

The South Carolina Department of Health and Environmental Control (SCDHEC).

INDUSTRIAL FLUIDS

All types of process and used waters that may be chemically, biologically or otherwise contaminated that would be a health hazard if introduced into the potable water supply.

PLUMBING OFFICIAL

The Building Code Enforcement Department of the City of Greenville and the County of Greenville.

POTABLE WATER

Water safe for human consumption according to recognized standards.

USED WATER

Any water supplied by the Water Purveyor that has passed the water service connection.

WATER PURVEYOR

The owner or operator of a public or private potable water supply.

WATER SERVICE CONNECTION

The point where the public potable water system and the customer's water system connect. This water service connection may be at the downstream end of a water meter, the property line of unmetered service connections, fire hydrant outlets, or other temporary or emergency service connections.

SECTION 2

RESPONSIBILITIES

2-1 THE WATER PURVEYOR

The water purveyor (GW) has the primary responsibility for the prevention of backflow into the public water supply system. Such responsibility begins at the water supply, and includes water treatment facilities, water storage facilities, water distribution piping systems, and ends at the water service connection. The water purveyor shall evaluate new and existing water service connections to determine the need for installation of backflow prevention assemblies. Files shall be maintained with water customer information, and customers shall be notified of the required backflow prevention assembly testing. The Water Purveyor shall cooperate with the Plumbing Official and the Health Official for cross connection control for new construction, or repairs or additions to customer's water systems.

2-2 THE PLUMBING OFFICIAL

The Plumbing Official (City of Greenville Plumbing Inspector or County of Greenville Building Inspectors) enforces the provisions of the International Plumbing Code as adopted for the applicable area, including but not limited to those provisions regarding backflow, back siphonage or cross connections form the customer's water service connection to the extremities of the customer's water system. The plumbing official has the primary enforcing responsibility of new installations, alterations, or repairs of customer's water systems.

2-3 THE HEALTH OFFICIAL

The Health Official (SCDHEC) legislates and enforces the laws, rules, and regulations of the state of South Carolina concerning water quality. The Health Official monitors the Water Purveyor's Cross Connection Control Program.

The Health Official trains and certifies testers of backflow prevention assemblies. A list of certified testers is maintained by the Health Official who renews and revokes certification as necessary.

The Health Official reviews backflow prevention assemblies and provides a current list of approved assemblies for installation and use in South Carolina.

2-4 THE CUSTOMER

The Customer is responsible for maintaining any special plumbing fixtures or devices designed to accommodate variations in the water pressure. Such devices or fixtures include, but are not limited to, thermal expansion tanks, relief valves and pressure reducing valves. GW water supply is subject to variations in pressure, and is subject to being shut off for repairs, maintenance, and construction, planned or unplanned.

The Customer shall not install, permit to be installed, or maintain any unprotected cross connections beyond the water service connection point.

Auxiliary water systems, industrial fluids, recycled water, product manufacturing, processing, fire protection systems, irrigation systems, and temperature increasing devices, among other systems are considered cross connections.

The Customer is responsible for obtaining all necessary permits and inspections and being in compliance with all applicable codes and regulations as required by the Plumbing Official, the Health Official, GW or other official as required for changes or alterations, additions, or new construction to their water supply system.

The Customer shall assist the GW CCCC, the Plumbing Official and the Health Official in surveying or inspecting their existing water supply system, or any plans of proposed changes or additions for actual or potential cross connections and the degree of hazard.

The Customer shall install, test, and maintain all backflow prevention assemblies as required by GW, the Health Official or the appropriate authority having jurisdiction.

The Customer will be responsible for all costs related to the purchase, installation, testing and maintenance of all backflow prevention assemblies required. The customer is responsible for compliance with these requirements even if the customer does not own the water system beyond the service connection.

The Customer should contact the GW CCCC prior to purchasing or installing a backflow prevention assembly.

SECTION 3

EVALUATING NEW AND EXISTING WATER SERVICE CONNECTIONS

3-1 NEW INSTALLATIONS FOR NEW CUSTOMERS/ACCOUNTS

3-1.1 New customer makes application and purchases appropriately sized water service connection.

3-1.2 GW provides applicant with **"WATER SERVICE CONNECTION CROSS CONNECTION CONTROL QUESTIONNAIRE"** (see example Appendix A-1).

3-1.3 Applicant completes Questionnaire and returns it to the GW CCCC.

3-1.4 GW CCCC reviews Questionnaire and determines the type of backflow prevention assembly required (if any) and notifies applicant in writing of requirements.

3-1.5 Applicant has backflow prevention assembly and its enclosure completely installed according to all GW requirements found in the Manual of Cross Connection Control, (see Pages 11-12; and Appendices A-2 and A-3, B-1 thru B-5). Other requirements not found in these references will be defined by the GW CCC Department. Applicant then notifies the GW CCC Department at least two days prior to the required inspection at (864) 241-6100. All local plumbing, SCDHEC and manufacturers' installation requirements shall be met.

3-1.6 GW will make site inspections and if the installation is found to be satisfactory the meter or service will be unlocked and turned on. If installation deficiencies are found during the inspection, the customer is notified and will correct all such deficiencies and a follow up inspection shall be completed before the service is turned on.

3-2 EXISTING SERVICE CONNECTIONS

Existing service connections shall be evaluated individually as deemed necessary by GW for degree of hazard and immediate backflow threat to the potable water system. Any change in use of service can result in additional backflow device requirements.

3-2.1 A **WATER SERVICE CONNECTION CROSS CONNECTION CONTROL QUESTIONNAIRE** will be forwarded to the customer and is completed by the customer, then returned to the GW CCC Department.

3-2.2 The GW CCC Department reviews the questionnaire and makes an appointment with the water customer for a site survey. In selected cases a site survey may not be necessary.

3-2.3 The customer is notified in writing of backflow prevention assembly requirements with an installation deadline.

3-2.4 The customer has the backflow prevention assembly completely installed according to all GW requirements found in the manual of cross connection control, (See pages 11 and 12; and Appendices A-2 and A-3, B-1 thru B-5) all local plumbing, SCDHEC and manufacturers' installation requirements shall be met. The customer shall notify the GW CCC Department two days prior to the required inspection at (864) 241-6100.

SECTION 4

POLICY STATEMENTS

4-1 INSPECTION OF CUSTOMERS PREMISES

The customer shall make their premises open at all reasonable times for the purpose of permitting any inspections, or surveys, or administering any duties imposed or mandated by this policy. GW, the Plumbing Official, or the Health Official shall have the right to enter the premises of any customer. Each customer as a condition of continued delivery of water to their premises shall be required to consent for inspectors to enter upon their premises for the purpose stated herein. An appointment will be made for routine surveys, or inspections. Emergency inspections or investigations may be conducted without advance notice.

4-2 EXISTING BACKFLOW PREVENTION ASSEMBLIES

If GW has determined that an existing assembly will provide adequate backflow protection to the potable water supply it shall be permitted to remain in service, however when it becomes necessary to replace or change the size or an entire backflow prevention assembly, the procedures and requirements of the most current CCCM shall be met. Routine maintenance and repairs are not included under this requirement. However, if GW determines that the existing assembly shall be replaced with an assembly meeting current GW CCC requirements it will be done so by the customer at their expense.

4-3 NON COMPLIANCE / DISCONTINUANCE OF SERVICE

GW shall not provide water service to any customer unless backflow protection is provided and properly tested and maintained as required by State laws and Regulations, and this CCCM. Water service to any premises can be discontinued after notice in writing by GW if backflow prevention assemblies are not installed, tested, or maintained as mandated by this policy. A cut off letter will be sent regarding the non-compliance and notifying that discontinuance of water service will occur within 7 days if the non-compliance is not corrected. Removal or by-passing of backflow prevention assemblies or falsification of test results shall also be grounds for discontinuance of water service. Service will not be restored until such conditions or defects are corrected in conformance with the current CCCM. The customer shall be responsible for all applicable reconnection fees and charges.

Fees for non-compliance of the regulations of this policy are as follows:

15 to 30 days late: $100
31-60 days late: $250
60+ days late: $500

GW shall not be liable for damages, losses, or claims arising from discontinuance of water service.

4-4 FIRE HYDRANT USAGE

The purpose of this policy is to minimize "unauthorized" usage of water from GW fire hydrants, protect system integrity and water quality, and preserve fire protection, while maintaining the ability to provide temporary water needs to area contractors at the lowest cost and in the most efficient manner.

4-4.1 **This policy refers to usage of public fire hydrants only.** The use of fire hydrants on private property (typically painted red) is expressly prohibited for purposes other than fire protection.

4-4.2 Section 2 Fire Hydrant Usage: from the *Greenville Water Rules and Regulations* serves as a guideline by which fire hydrant usage is approved. This article states that the only approved usage of water from a fire hydrant (other than that by the Greenville Water or local fire departments) is for "temporary construction purposes." Temporary construction purposes can be best defined as any construction site on which water service will not be established in the future, such as: highway construction, road resurfacing, utility installations along public roads, street cleaning, and dust control.

4-4.3 Contact Engineering at 864-241-6100 for current policy on fire hydrant usage. Fees, applications, & general requirements for temporary fire hydrant usage can also be found on the Greenville Water website under the Engineering department section. All fire hydrant usage shall occur through an approved meter and backflow device.

SECTION 5

BACKFLOW PREVENTION ASSEMBLY INSTALLATION REQUIREMENTS

5-1 HAZARD APPLICATIONS

Reduced pressure principle assemblies or an air gap shall be used for cross connection control of the **HIGH HAZARD CATEGORY.**

Double check valve assemblies or dual check valve assemblies shall be used for cross connection control of the **LOW HAZARD CATEGORY**.

5-2 LOCATION

Installation of these assemblies will usually be in a box near the water meter or inside a building in a mechanical area, and prior to the first connection off the service line. GW will review each site and make a recommendation for the location of the assembly. The standard procedure will be **CROSS CONNECTION CONTROL BY CONTAINMENT**.

5-3 RESIDENTIAL IRRIGATION REQUIREMENTS

The installation of a dual check valve on the meter setter will be required for newly installed residential irrigation systems only.

5-3.1 EXISTING RESIDENTIAL IRRIGATION

Existing residential irrigation systems currently utilizing the DCVA for backflow prevention are being phased out by Greenville Water. The program to install dual check valve meter setters (non-testable) to replace the existing DCVA which is a testable device is underway. If the DCVA is not replaced with a dual check within fifteen (15) years of the effective date of this policy, it must be tested at that time (and once every fifteen (15) years thereafter) by a DHEC **CERTIFIED TESTER** to ensure its proper operation (see Section 7 TESTING).

5-3.2 NEW INSTALLATIONS

The dual check valve will be part of the meter setter *on newly installed meters*. Replacement of the internal parts of the assembly will be performed by Greenville Water once every thirty years.

5-4 DCVA AND RP INSTALLATION CHECKLIST

5-4.1 The assembly must appear on the GW list of approved backflow prevention assemblies. See Appendices A-2, and A-3.

5-4.2 The assembly shall have resilient wedge gate valve or ball valves at each end of the assembly.

5-4.3 The assembly shall have four test cocks properly located for testing.

5-4.4 No by-pass is permitted around the assembly unless there is an equal backflow prevention assembly in the by-pass.

5-4.5 All manufacturers' installation requirements shall be consulted and followed, including hot water and high pressure applications.

5-4.6 Customers with situations that prohibit shutting off the water service to test or repair the assembly should install a backflow prevention assembly in parallel or install a separate parallel duplicate service line with proper backflow protection.

5-4.7 Requirements for height and side clearance must comply with Appendices B-1 thru B-5.

5-4.8 All backflow prevention assemblies shall be installed in an enclosure or building on the customer's property to prevent damage from freezing, traffic or vandalism, and shall be readily accessible for testing and maintenance.

5-4.9 The customers' plumber or contractor shall install adequate thrust restraints. Upon inspection, GW may require additional thrust restraints where deemed necessary.

5-4.10 The customer shall design and install adequate pipe supports. Upon inspection, GW may require additional pipe supports where deemed necessary.

5-4.11 A strainer may be needed between the water service connection and the backflow prevention assembly to prevent particles from fouling the check assemblies.

5-5 FOR REDUCED PRESSURE PRINCIPLE (RP) ASSEMBLY ONLY

5-5.1 Conditions may exist where periodic pressure fluctuations cause the relief valve of the assembly to discharge to the point of becoming a nuisance. In this event, the customer should install an additional check valve prior to the assembly.

5-5.2 Relief valve drain piping must meet approved air gap requirements. The air gap distance requirement is equal to **two (2) times the relief valve diameter or 1-inch, whichever is greater**. The piping shall be sized to exceed the discharge rate of the relief valve.

5-5.3 The relief valve shall **never** become submerged.

5-5.4 Underground installations of RP assemblies are discouraged and will only be permitted in unusual circumstances where an adequately sized gravity drain can be installed to the surface of the ground.

SECTION 6

FIRE SUPPRESSION/SPRINKLER SYSTEMS

6-1 PROCEDURE FOR OBTAINING FIRE PROTECTION SERVICE

6-1.1 Three copies of plans will be submitted to the Greenville Water Cross Connection Control Department for review and approval. The following minimum information is to be included on the fire protection plans:

- **A.** Private fire protection system (internal piping and underground piping) with material list clearly indicated. Indicate the direction of opening of valves and fire hydrants.
- **B.** Name of street adjacent to the property to be served and the distance to the nearest street intersection.
- **C.** Size of water main in the street.
- **D.** Fire protection pit to be located on private property near the public right-of-way. Plan and elevation of pit to include the following minimum information:
  1) Pit dimensions
  2) Note stating the pit is precast concrete or concrete block.
  3) Type of access hatch (Bilco, Halliday, or approved equal with slamlock is required)
  4) Type of Double Check Valve Assembly
  5) Location of Test Cocks
- **E.** Property owner's name, address, and phone number. If the property owner is a company, give name of company official and title.

6-1.2 Items to be completed before the tap will be made to serve the private fire protection system:

- **A.** Plan approval by the Greenville Water. One copy will be returned to the submitting entity, one copy will be mailed to the property owner and one copy will be retained by the Greenville Water.
- **B.** Payment of applicable tapping fees.
- **C.** Copy of State, City, or County encroachment permit.
- **D.** Original Fire Protection Contracts (2) signed by customer (faxed copies will not be accepted).
- **E.** Completion of installation fire protection pit and appurtenances in accordance with approved plans and final pit inspection by the Greenville Water.

NOTE: All excavation, backfilling, final valve box adjustment and pavement replacement shall be the responsibility of the contractor.

6-1.3 Contractor shall notify Greenville Water when system is put into service, so that tapping valve can be checked to confirm that it is completely open. After valve inspection, Greenville Water will assign an account number and return a copy of the Fire Protection Contract to the owner.

6-2 DEGREE OF HAZARD FOR FIRE PROTECTION SYSTEMS

Each private fire protection system shall be evaluated by site and/or plan survey for degree of hazard. Backflow prevention assemblies commensurate with the degree of hazard shall be required on all connections to the GW.

6-2.1 HIGH HAZARD CATEGORY

Systems considered **high hazard category** include, but are not limited to: antifreeze systems, foam injection systems and systems supplied from or connected to, lakes, ponds, streams, or any other source other than the GW system. High hazard category fire protection systems will require a **REDUCED PRESSURE PRINCIPLE ASSEMBLY** on any connection to the GW as close as possible to the service connection and the property line.

6-2.2 LOW HAZARD CATEGORY

Systems considered **low hazard category** fire protection systems shall include simple wet or dry fire sprinkler systems. A **DOUBLE CHECK VALVE ASSEMBLY** is required on any connection to the GW as close as possible to the service connection and the property line.

In isolated cases the backflow prevention assembly must be installed inside the building. A **DOUBLE CHECK VALVE ASSEMBLY** shall be installed on the riser piping immediately above the floor. Under no circumstances will an interior assembly be installed when such location requires more than 50 feet of pipe from water main tap to riser.

SECTION 7

TESTING

All backflow prevention assemblies shall be tested by certified testers in accordance with SCDHEC and GW regulations.

7-1 NEW ASSEMBLIES

All new testable assemblies shall be tested upon installation and before use by the customer. The installer shall contact a certified tester to test the device and forward the test report to the GW CCC Department. The report must be received by GW within 10 days of starting the water service.

7-2 EXISTING ASSEMBLIES

All existing backflow prevention assemblies shall be tested a minimum of once annually as determined by the current GW CCC policy, the Health Official, or the Plumbing Official.

Customers with existing backflow prevention assemblies will be notified by letter from GW to have the periodic test performed. The customer will be responsible for contacting a certified tester and having the test made within **45 DAYS** of notification. The completed report shall be returned to GW within **15 DAYS** of the test due date. All test forms shall be received by GW within **60 DAYS** of first notification letter date. Failure to test a backflow device during the 60 day period will result in fines as established in section 4-3.

If the assembly fails the required test and cannot be repaired immediately (i.e., repair parts on order) the tester shall return a copy of the test report explaining the test failure to the GW the same day. After the assembly is repaired, the assembly shall be tested immediately and the completed report shall be returned to GW the same day.

7-3 FOLLOW UP RETEST

GW will randomly choose a number of recently returned test reports and retest the assembly, at its expense. The customer will be notified in advance of this retest. This retest is for verification information on testers, and compliance with SCDHEC requirements.

7-4 TESTING NONCOMPLIANCE

Notifications for device testing will follow the schedule noted below. Customers failing to return completed test reports to GW within the 60 day period shall be considered in **noncompliance**. At that time, GW will proceed with the administrative actions up to and including discontinuance of water service as outlined in Section 4-3.

7-5 NOTIFICATION SCHEDULE FOR BACKFLOW DEVICE TESTING

GW will send out mailed notifications to the address on file for the account which the backflow device is associated with. The initial notification letter will be sent out 45 days prior to device test due date. GW has a 15 day grace period after the test due date to allow for a passing device test or a replacement device and passing test to be submitted to the CCCC.

A second reminder notice will be mailed out a week before the due date for those account(s) that have not submitted a passing test result.

A third certified notice will be mailed out 30 days after the test due date to inform the customer of the noncompliance. When a customer receives the certified third notice the fines noted in section 4-3 will be in full effect until a passing test is submitted. If the device goes untested beyond 60 days past the device test due date, GW reserves the right to discontinue water service until the noncompliance is corrected.

SECTION 8

THERMAL EXPANSION

There are several regulatory agencies that require Greenville Water to maintain a viable Cross Connection Control Program. Backflow can occur from any water service connection. Since 1971, GW has required backflow prevention assemblies to be installed on all service connections. These practices continue today in an effort to prevent backflow from entering the potable water supply.

Practically all customers utilize heated water in their plumbing system. When water is heated, its physical character changes and it expands. This expanded water needs to occupy more space. This is known as Thermal Expansion. Often, thermal expansion will cause water temperatures to rise and pressure relief valves to discharge due to excessive water pressures, usually at above 150 psi. Before backflow preventers were installed on service lines, this expanded water pushed back into the Greenville Water's distribution system. This was known as an open system. An open system is no longer possible where a backflow preventer is present at the meter.

The three most popular methods of dealing with the effects of thermal expansion are: installing a bladder type expansion tank, a special ball cock and relief valve in the water closet, or a remote thermal expansion relief valve. The GW suggests you discuss these alternatives with a licensed plumber. The installation of these three devices can be "do-it-yourself" projects.

Greenville Water will make its best effort to continue to provide safe potable water to all customers. Backflow prevention assemblies are a necessary means to protect Greenville Water's water distribution system. If you have any questions concerning thermal expansion as it relates to cross connection control, call 864-241-6100.

APPENDIX A

FORMS

GREENVILLE WATER
CROSS CONNECTION SURVEY

Date: _____

Owner: _____ Applicant: _____

Service Address: _____
_____

COMMERCIAL
(Check all that apply)

Type of Business (i.e. medical, restaurant, etc.): _____

Flow Requirements (in gpm): Domestic _____ Fire _____ Irrigation _____

Purpose of water usage:

Processing	☐	Product	☐	Cooling	☐
Restaurant	☐	Carwash	☐	Gas Station	☐
Photo lab	☐	Chemical Lab	☐		

Chemical Usage? Yes ☐ No ☐ If yes, list chemicals used: _____

Boilers? Yes ☐ No ☐ If yes, list type: Steam ☐ Hot water ☐ Other ☐

Auxiliary Water Storage? ☐ If yes, Type and Capacity _____
Is storage filled with GW Water? ☐ If not, from what source is it filled? _____

Swimming Pool? ☐ If yes, filled by? Hose ☐ Piped ☐ Chemical Injection? Yes ☐ No ☐

IRRIGATION (if applicable)

Chemical injection used? Yes ☐ No ☐

Greenhouse/Commercial Gardens? Yes ☐ No ☐

FIRE SERVICE (if applicable)

Type of System: Dry ☐ Wet ☐ Anti-freeze ☐ Foaming agents ☐

Fire Pump required? ☐ Type of pump & capacity _____

Auxiliary Water Storage required? ☐ If yes, is it filled with GW water? Yes ☐ No ☐
If no, from what source is it filled? _____

Fire Department Connection? Yes ☐ No ☐ Any existing fire system? Yes ☐ No ☐

Additional Information:

APPENDIX B

DRAWINGS