The Florida Keys Aqueduct Authority

Cross Connection Control Program Manual

2018

Engineering Department
Water Quality Division

Adopted 1998; Revised 2012, 2016, 2018
Document ID#: FKAA CCC Program Manual, Rev 3, 2018-Sep-7

TABLE OF CONTENTS

FORWARD

This manual describes the Florida Keys Aqueduct Authority's Cross-Connection Control Policy and Program. Its purpose is both to inform and educate our customers, developers, and persons involved in the design and installation and testing of backflow prevention assemblies. This manual also serves as an outline of the Florida Keys Aqueduct Authority's responsibilities in insuring that water quality is maintained. These responsibilities include the on-site inspection of existing and new facilities, plan reviews, screening new and existing accounts, and monitoring backflow preventer installation, testing and maintenance.

We urge you to acquaint yourself with the policies and information presented in this manual. It is only through the education and commitment of persons like yourself that we can control the hazards presented by cross connections within our public drinking water supply. The Florida Keys Aqueduct Authority stands behind this policy and its enforcement and will offer its assistance to all who share the responsibility of safe drinking water.

CHAPTER 1

INTRODUCTION

INTRODUCTION

The purpose of the Cross-Connection Control Program is to prevent the contamination of the Public Water Supply (PWS ID# 4134357 & 5444047) from any influx of potentially hazardous chemicals or organisms from outside sources. This is accomplished through a program aimed at identifying health and pollution hazards and eliminating potentially hazardous cross connections found in any water-using establishment which is connected to the public water supply system. Appropriate protection will be required to be installed, tested, and maintained, under the direction of the Authority, for all establishments which could under foreseeable circumstances cause backflow of nonpotable fluids or substances into the public main. The goal of the program is to maintain a safe, high quality potable water system to serve every Authority customer.

WHAT IS A CROSS CONNECTION

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 the result of backflow. By-pass arrangements, jumper connections, removable sections, swivel or changeable devices, and other temporary or permanent devices through which or because of which backflow could occur are considered to be cross-connections.

Backflow is literally a reversal in the normal direction of flow within a water system which can turn a cross connection into a health or pollution hazard. Consequently, either cross- connections or the possibility of backflow must be eliminated to prevent these "unseen hazards" from degrading the high quality of water that the Authority strives to maintain.

HISTORY

In Florida, the primary responsibility for safeguarding water quality on private property was left to local health agencies and building and inspection departments. Then, beginning with the "Safe Drinking Water Act", signed by President Ford on December 16, 1974, a chain of laws and regulations evolved that resulted in the State requirement (Florida Safe Drinking Water Act, Sections 403.850 - 403.864, Florida Statutes) for all the public water systems to have a cross-connection control program. As prescribed in Chapter 62-555.360 of the Florida Administrative Code (F.A.C.), the State of Florida, adopted the following policy: "Community Water Systems (CWS) shall establish and implement a routine cross-connection control program to detect and control cross-connections and prevent backflow of contaminants into the water system. This program shall include a written plan that is developed using recommended practices of the American Water Works Association set forth in *Recommended Practice for Backflow Prevention and Cross-Connection Control*, AWWA Manual M14, as incorporated into Rule 62-555.330, F.A.C."

"Upon discovery of a prohibited or inappropriately protected cross-connection, public water systems either shall ensure that the cross-connection is eliminated, shall ensure that appropriate backflow protection is installed to prevent backflow into the public water system, or shall discontinue water service. If the discovered cross-connection is on the premises of a customer of a community water system (CWS) and if the customer's premises is in a category described in Table 62-555.360-2, which appears at the end of this section, the CWS shall ensure that appropriate backflow protection is provided at or for the water service connection to the customer regardless of whether the cross-connection is eliminated or whether internal backflow protection is installed at the cross-connection to the customer's plumbing system." (62-555.360 (3), F.A.C.).

In compliance with the mandate, the Florida Keys Aqueduct Authority adopted by rule the Cross Connection Control Policy on October 17, 1986 and implemented the policy as contained in Chapter 3 of this manual.

Further information contained in this manual also describes causes of backflow, the objectives of the Cross-Connection Control Program, responsibilities, and technical data on backflow preventers and installations.

CAUSES OF BACKFLOW

Where potential cross connections exist, protection against backflow is needed to eliminate the possibility of contamination. The causes of backflow cannot usually be eliminated completely since backflow is often initiated by accidents or unexpected circumstances. However, some causes of backflow can be partially controlled by sound design and informed maintenance. Listed below are the major causes of backflow as outlined under the two categories of backflow - backsiphonage and backpressure.

A. BACKSIPHONAGE

Backsiphonage is caused by reduced or negative pressure being created in the supply piping. A major cause of backsiphonage is the interruption of the supply pressure. This will allow negative pressures to be created by water trying to flow to a lower point in the system. Another cause is undersized piping. If water is withdrawn from a pipe at a very high velocity, the pressure in the pipe is reduced and pressure differential created can cause water to flow into the pipe from a contaminated source. The potable water supply can thus become contaminated due to backsiphonage of contaminants creating potential health problems.

The principal causes of backsiphonage are:

1. Line repair or break which is lower than a service point.

2. Undersized piping - If water is withdrawn from a pipe at a very high velocity, the

pressure in the pipe is reduced and the pressure differential created can cause water to flow into the pipe from a source not under the sanitary control of the Authority.

3. Lowered pressure in the water main due to a high-water withdrawal rate such as firefighting, water main flushing, or water main breaks.

4. Reduced supply main pressure on the suction side of a booster pump.

B. BACKPRESSURE

Backpressure may cause backflow to occur where a potable water system is connected to a nonpotable system, and the pressure in the nonpotable system exceeds that in the potable water system. Where high pressures may be created by means of pumps, boilers, etc., there is high risk of nonpotable fluid being forced into the potable water system whenever these types of cross connections are not properly protected.

The principal causes of backpressure are:

1. Booster pump systems designed without backflow prevention devices.

2. Potable water connections to boilers and other pressure systems without backflow prevention assemblies.

3. Connections with another system which may, at times, have a higher pressure.

4. Water stored in tanks or plumbing systems, which by virtue of their elevation, would create head pressure sufficient to cause backflow if pressure is lower in the public system.

CHAPTER 2

PROGRAM OBJECTIVES

OBJECTIVES

The objectives of the Florida Keys Aqueduct Authority's Cross-Connection Control Program are to protect the Florida Keys public water supply from the possibility of contamination via backflow from private or other connected water systems through implementation of the following:

1. Inspection and identification of those facilities which pose a potential health (high) or pollution (low) hazard and determination of the appropriate mechanism by which the water systems of these facilities must be contained.

2. Insuring the proper installation, testing, operation, and maintenance of approved backflow assemblies is executed by the Authority or as directed by the Authority.

3. Providing a continuing education and inspection program of cross-connection control which will systematically and effectively control all actual and potential cross connections that may be installed in the future.

4. Enacting program measures that ensure compliance with the Safe Drinking Water Act.

CHAPTER 3

POLICY

Component I per 62-555.360 F.A.C.

POLICY

48-104.013 CROSS-CONNECTION CONTROL (WATER)

Pursuant to Section 48-104.013 of the Florida Keys Aqueduct Authority's Rules and Regulations (Adopted 12/19/02; Revised: 10/01/17), no Cross-Connections are allowed between the Authority's potable water supply and any other system containing water or any other substance which may be capable of imparting contamination or pollution which would change the quality of water conveyed by the Authority's system. To protect the public water supply system from pollution or contamination, or other quality change, due to Cross-Connection, the following restrictions apply:

(1) No installation of potable water supply piping or part thereof shall be made in such a manner at any Premises so as to violate plumbing code 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 gas, liquid or solid which may be capable of imparting contamination to the public water as the result of backflow.

(2) No Person shall make or allow a connection to exist at any Premises between pipes or conduits carrying potable water supplied by the Authority or private water Service system and any pipes, conduits, or fixtures containing or carrying liquids, gas, or other substances from any other source.

(3) No plumbing fixture, appliance, water using apparatus or device, or construction shall be installed or maintained or shall be connected to any public or private potable water supply, when such installation or connection may provide a possibility of polluting such water supply, or may provide a Cross-Connection between a Distribution System of potable water used for drinking and other domestic purposes and water which may become contaminated by such plumbing fixture, appliance, device or construction.

(4) No water Service piping supplied by any auxiliary water supply source (i.e. well, cistern, swimming pool, etc.) or industrial process or water piping system owned by any Person shall be connected to the public potable water system owned and operated by the Authority.

(5) The Authority shall require the installation of an approved backflow prevention assembly which complies with the Manual of Cross-Connection Control and available for inspection in the Authority's Engineering Department, Water Quality Division.

(6) The testing, maintenance, and repair on backflow prevention assemblies installed for containment of domestic water Service Connections and conveyed to the Authority for such purposes shall be performed in accordance with the Manual of Cross-Connection Control. The Authority shall require Customers to be responsible for testing, maintenance, and repair of backflow prevention assemblies installed on fire protection systems.

(7) Service of water to any Premises shall be disconnected by the Authority if a backflow prevention assembly required by the Authority is not installed, tested and maintained; or if it is found that a backflow prevention assembly has been removed or by-passed, or if unprotected Cross-Connections exist on the Premises; or there is inadequate backflow prevention at the Service Connection. Water Service will not be restored until such conditions or defects are corrected and evidence thereof is provided to the Authority. All current turn-off and turn-on Service charges shall be paid by the Customer.

(8) In the event that a Customer fails to test the backflow prevention assembly required on a separate fire protection Service line, or fire/domestic dual Service line as scheduled, the Authority reserves the right to disconnect the domestic water Service until the assembly is tested and evidence thereof is provided to the Authority.

(9) If any Customer should have any questions regarding Cross-Connection, that Customer should contact the Authority's Engineering Department, Water Quality Division.

****FROM THE FLORIDA KEYS AQUEDUCT AUTHORITY**
RULES AND REGULATIONS (FOUND ON WEBSITE: WWW.FKAA.COM)

CHAPTER 4

DEFINITIONS

DEFINITIONS

For the purpose of this manual, the following words, terms and phrases shall be interpreted as having the following meanings:

AIR-GAP SEPARATION (AG) -

A physical separation with an unobstructed vertical distance through 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 said vessel. An approved air-gap separation shall be at least double the diameter of the supply pipe, measured vertically above the top of the rim of the receiving vessel; and, in no case less than one inch. When an air-gap separation is used at the service connection to prevent the contamination or pollution of the public potable water system, and continuity of service is required, an emergency bypass shall be installed around the air-gap separation system and an approved reduced pressure principle backflow prevention assembly shall be installed in the bypass system.

APPROVED -

a. As herein used in reference to a water supply, shall mean a water supply system that has been approved by the Florida Department of Environmental Protection (FDEP).

b. As herein used in reference to air-gap separation, a double check valve assembly, or a reduced pressure assembly, a backflow prevention assembly or method, shall meet the approval of the Florida Keys Aqueduct Authority.

Authority -

The Florida Keys Aqueduct Authority

AUXILIARY WATER SUPPLY -

See Water Supply, Auxiliary -

BACKFLOW -

The undesirable reversal of the flow of water or other liquids, mixtures, gases or other substances into or toward the distribution piping of a potable supply of water from any source or sources other than its intended source.

BACKFLOW PREVENTION DEVICE -

Any effective device, method or construction used to prevent backflow into a potable water system. The type of device used should be based on the degree of hazard, either existing or potential.

BACKFLOW PREVENTION ASSEMBLY, APPROVED -

An assembly that has been investigated and approved by the Florida Keys Aqueduct Authority and has been shown to meet the design and performance standards of the American Society of Sanitary Engineers (ASSE) and/or the American Water Works Association (AWWA) and/or the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR). The approval of a backflow prevention assembly by the Authority is based on a favorable report by an approved testing laboratory, recommending such an approval.

BACKFLOW PREVENTION ASSEMBLY TESTER CERTIFIED -

A person who has proved his certified competency to the satisfaction of the Florida Keys Aqueduct Authority. Each person who is certified to make competent tests and reports on backflow prevention assemblies shall be conversant with applicable laws, rules, regulations, and shall have attended and successfully completed the TREEO (Training, Research and Education for Environmental Occupations) Certification Program for Backflow Prevention Assembly Testers, or other program as accepted by the Authority.

BACKPRESSURE -

Any elevation of pressure in the downstream piping system (by 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 flow through the backflow prevention assembly.

BACKSIPHONAGE -

The sudden reduction of pressure in the potable water supply system causing a flow of water or other liquids, mixtures or substances into the distribution pipes and/or potable water supply system through an unprotected cross connection.

CONTAMINATION -

See Hazard, Contamination -

CROSS CONNECTION -

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 or polluted water or other substances of unknown or unsafe quality which may be capable of contaminating the public

water supply as a result of backflow. By-pass arrangements, jumper connections, removable sections, swivel or changeable devices, and other temporary or permanent devices through which or because of which backflow could occur are considered to be cross-connections.

DOUBLE CHECK VALVE ASSEMBLY (DCVA) -

An assembly of at least two single, independently operating approved check valves with tightly closing shut-off valves on each side of the assembly, plus properly located test cocks for testing of each check valve. The entire assembly shall meet the design and performance specifications and approval of a recognized, Authority approved, testing agency for backflow prevention assemblies. These assemblies must be readily accessible for maintenance and testing to be approved.

DOUBLE CHECK VALVE BACKFLOW PREVENTION DETECTOR ASSEMBLY (DCDA) -

A Double Check Valve Assembly with an incorporated detector meter.

EXECUTIVE DIRECTOR -

The Executive Director of the Florida Keys Aqueduct Authority, who shall be responsible for the management of the affairs of the said Authority.

FIRE PROTECTION SYSTEM -

Any system, public or private, used exclusively for the purpose of having water ready for the extinguishing of fire, usually sprinkler systems, hose rack systems or hydrant systems, metered or unmetered, connected or independent of the waterworks system.

FLOOD LEVEL RIM -

The edge of the receptacle from which water or other substances overflows.

HAZARD, CONTAMINATION (Health Hazard)

Actual and/or potential contamination of a physical and/or toxic nature to the public potable water system and/or the customer's potable water system to such a degree or intensity that there would be danger to the public's health.

HAZARD, DEGREE OF -

A qualification of what potential and/or actual harm may result from cross connections within a water-using facility. Establishing the degree of hazard of contaminants or pollutants that could feasibly enter the public water supply system is to be determined by the Authority.

HAZARD, PLUMBING -

A plumbing-type cross connection in a customer's potable water system that has not been properly protected by a vacuum breaker, air-gap separation, or other backflow prevention device. Unprotected plumbing-type cross connections can be considered a health hazard. They include, but are not limited to, cross-connected toilets, sinks, laboratories, wash trays, domestic washing machines, lawn sprinkling systems, hose bibs, and equipment associated with cisterns and wells including pumps, pressure tanks, and piping. Plumbing-type cross connections can be located in many types of structures, including homes, apartment houses, hotels and commercial and industrial establishments.

HAZARD, POLLUTION -

An actual/or potential threat to the physical properties or the potability of the public or the customer potable water system that would not constitute a health 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, or be aesthetically objectionable, or could cause minor damage to the system or its appurtenances.

HAZARD, SYSTEM -

An actual and/or potential threat of severe damage to the physical properties of the public or customer's potable water supply system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.

HEALTH AGENCY -

Refers to either the Monroe County Health Department, the Florida Department of Health and Rehabilitative Services, or the Florida Department of Environmental Protection, depending upon your jurisdiction.

HOSPITAL -

An institution, place, building, or agency which maintains or operates organized facilities for one or more persons for the diagnosis, care, and treatment of human illness, including convalescence care during and after pregnancy, or which maintains and operates organized facilities for any such purpose, and to which persons may be admitted for an overnight stay or longer. "Hospital" includes sanatorium, nursing home, and maternity home.

INDUSTRIAL FLUIDS -

Any fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration, such as would constitute a health, plumbing, pollution, or system hazard if introduced into an approved potable water supply. This may include, but is not

limited to: polluted or contaminated waters; all types of process waters and "used waters" originating from the public water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis; circulated cooling waters to an open cooling tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural water such as from wells, springs, streams, rivers, bays, harbors, seas, oceans, irrigation canals or systems, etc.; oils, gases, glycerines, paraffins, caustics or acetic solutions and other liquids and gaseous fluids used in industrial or other purposes or for firefighting purposes.

INDUSTRIAL PIPING SYSTEM, CUSTOMERS' -

Any system used by the customer for transmission of or to store any fluid, solid, or gaseous substances other than an approved potable water supply. Such a system would include all pipes, conduits, tanks receptacles, fixtures, equipment, and appurtenances to produce, convey, or store substances which are or may be polluting or contaminating.

INLET -

The open end of the water supply pipe through which the water is discharged into a plumbing fixture.

LABORATORY, APPROVED TESTING-

The Foundation for Cross-Connection Control and Hydraulic Research (FCCC HR) of the University of Southern California or other laboratory having the equivalent facilities for both the laboratory and field evaluation of assemblies approved by the American Water Works Association (AWWA) or the American Society of Sanitary Engineers (ASSE).

METER ASSEMBLY

The equipment approved by the Authority and used to measure the amount of water consumed by the customer which includes the Neptune T-10 meter with a dual check valve and Neptune T-10 meter/Double Check (T-10 DC) meter.

PLUMBING SYSTEM-

The water supply and distribution pipes, plumbing fixtures and traps, soil, waste and vent pipes, building drains and sewers, including their respective connections, devices and appurtenances within the property line of the premises, and water-treating or water-using equipment.

POINT OF SERVICE-

The point where the Authority's water meter assembly is connected to customer owned or operated water using facility, and where water service to the customer begins. If no water meter

is required and only a detector meter is installed, the point of connection is the property line where the Authority's pipe is connected to customer owned or operated facility. If a meter or meter assembly is installed at the end of the service connection, the service connection shall mean the downstream end of the meter or meter assembly. There shall be no unprotected takeoffs from the customer's service line ahead of any backflow preventer to the customer's water system.

POLLUTION-

See Hazard, Pollution -

POTENTIAL-

The possibility that piping may be changed, equipment may be used incorrectly, or negligence on the part of the customer may result in a backflow condition. A potential cross-connection exists if one or more of the following elements are present: bypass arrangements, jumper connections, removable sections, swivel or change over assemblies, hoses and hose bibs, or the presence of an abundance of piping that cannot be easily traced by Authority personnel.

PREMISES-

Any and all real property and tangible personal property affixed to real property served or capable of being served by the Authority as a result of the existence of a service connection.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (RP or RPZ) - (

An assembly containing within its structure a minimum of two independently operating, approved check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The assembly shall be fitted with tightly closing shut-off valves located at each end and with properly located test cocks for the testing of the check and relief valves. The entire assembly shall meet the design and performance specification and approval of the Authority-approved testing agency for backflow prevention assemblies. The assembly shall operate to maintain the pressure in the zone between the two check valves at a level less than the pressure on the public potable water supply side of the assembly. At cessation of normal flow, the pressure between the two check valves shall be less than on the public potable water supply side of the assembly. 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. When the inlet pressure is two (2) pounds per square inch or less, the relief valve shall open to the atmosphere.

REDUCED PRESSURE PRINCIPLE BACKFLOW-PREVENTION DETECTOR ASSEMBLY (RPDA) -

An RP with a detector meter included in the assembly.

SERVICE CONNECTION-

See Point of Service -

VACUUM BREAKER, ATMOSPHERIC (AVB)-

A vacuum breaker which is effective against backflow caused by backsiphonage only and designed for use where it will not be subjected to more than 12 hours static line pressure.

VACUUM BREAKER, PRESSURE (PVB)-

A vacuum breaker with a checking unit "poppet valve" that is usually activated by a spring. This type of vacuum breaker does not require a negative pressure to react and can be used on the supply side of a valve. The assembly shall have two tightly closing shut-off valves located at both ends and properly located test cocks for testing. Typically, this assembly is installed to isolate high hazard(s) from contaminating the customer's plumbing system when properly installed (ie. minimum 12" above highest downstream outlet).

WATER, POTABLE-

Water from any source which has been investigated by the Florida Department of Environmental Protection and which has been approved for human consumption.

WATER PURVEYOR-

The owner or operator of the public potable water system supplying an approved water supply to the public. The utility shall be one that is operating under valid permit from the Florida Department of Environmental Protection. As used herein the terms water purveyor and the Florida Keys Aqueduct Authority, may be used synonymously.

WATER SUPPLY, AUXILIARY -

Any water supply on or available to the premises other than the Authority's approved public water supply. These auxiliary waters may include water from another public water supply or natural source(s), such as a well, cistern, spring, river, stream, harbor, and so forth; used water or industrial fluids. These waters may be contaminated or polluted, or they may be objectionable and constitute an unacceptable water source over which the Authority does not have sanitary control.

WATER SUPPLY, UNAPPROVED-

Any water which has not been approved for human consumption by the Florida Department of Environmental Protection (Non-FKAA supplied water).

WATER SYSTEM, CUSTOMERS'-

Any water system located on the customer's premises, whether supplied by a public potable water system or any auxiliary water supply. The system or systems may be either a potable water system or a nonpotable water piping system.

WATER SYSTEM, CUSTOMERS' POTABLE-

That portion of the privately owned potable water system operated as a public utility, under a current permit, to supply water for domestic purposes. This system will include all sources, facilities and appurtenances between the source and the point of delivery such as pumps, appurtenances used to produce, convey, treat or store a potable water for public consumption or use.

WATER, USED-

Any water supplied by the water purveyor from a public potable water system to a customer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

CHAPTER 5

RESPONSIBILITY

RESPONSIBILITY

A. FLORIDA KEYS AQUEDUCT Authority

Under Section 62-555.360 of the FDEP Rules and in accordance with the *Recommended Practice for Backflow Prevention and Cross-Connection Control: AWWA Manual M14*, Third Edition, Chapter 2, the water purveyor has the primary responsibility to prevent water from unapproved sources, or any other substances, from entering the public water system. Upon discovery of a prohibited cross connection, the Authority is directed to either eliminate the cross connection by requiring the installation of an appropriate backflow assembly or discontinuance of service until contaminated source is eliminated. Thus, the Florida Keys Aqueduct Authority, as the water purveyor to the Florida Keys, assumes the following responsibilities:

1. To protect the public water supply from the possibility of contamination by containing its customers' private water system, contaminants or pollutants which could, under adverse conditions, backflow through uncontrolled cross connections into the public water system;

2. To administer an on-going inspection program of cross-connection control, which will systematically and effectively control all actual or potential cross connections which may be installed in the future; and

3. To provide evidence of regular testing, maintenance, and repair, if needed, of backflow prevention assemblies for continuous monitoring.

B. STATE OF FLORIDA, MONROE COUNTY HEALTH DEPARTMENT

The Monroe County Health Department is responsible for promulgating and enforcing laws, rules, regulations, and policies to be followed which protect the Authority and all water supply systems and water sources from contamination and pollution via backflow. Thus, the DOH and FDEP have the following primary responsibilities:

1. To ensure that the Authority provides potable water at the point of delivery to the customer's water system; and

2. To ensure that the customer's potable water system is maintained free of sanitary hazards, including unprotected cross connections.

C. PLUMBING OFFICIAL

The plumbing official is responsible for enforcing the provisions of plumbing code as to ensure the potability of the customer's water supply from the point of service from the

Authority at the customer's service connection, to the extremities of the customer's water system. Thus, the plumbing official has the following primary responsibilities:

1. To prevent cross connections from being designed and built into the structures by reviewing building plans and inspect plumbing during installation; and

2. To eliminate cross connections or require approved backflow protection.

D. CUSTOMERS

The customer has the responsibility of preventing contaminants and pollutants from entering his potable water system and the Authority's water system. The customer's responsibility starts at the point of delivery from the Authority's water system and includes all of his water system(s). Thus, the customer has the following primary responsibilities:

1. To prevent and eliminate cross connections or provide adequate backflow protection as required by plumbing code, health department, and the Authority;

2. To insure backflow prevention assembly (ies) within their plumbing system, are in good operating condition and prevent backflow; and

3. To notify the Authority immediately of the possibility of contamination or pollution of the Authority's or customer's potable water system due to backflow on or from the customer's premise and promptly take action to confine further spread of pollution or contamination from the source.

E. BACKFLOW PREVENTION ASSEMBLY INSTALLERS

The installer has the responsibility to make proper installation of backflow prevention assemblies in accordance with the manufacturer's installation instructions and any additional instructions furnished by the Authority. The installer is also responsible to make sure a backflow assembly is adequate protection and working properly when it is installed. Refer to Chapter 9 for additional installation instructions.

All RPs and DCVAs are required to be tested following installation by a certified FKAA backflow prevention assembly technician.

CHAPTER 6

WATER SYSTEM SURVEYS AND INSPECTIONS

Component IV per 62-555.360 F.A.C.

WATER SYSTEM SURVEYS AND INSPECTIONS

A. INITIAL INSPECTIONS

In order to determine the degree of hazard to the public potable water system, a survey will be made of the customer's presently installed water system. This survey need not be a detailed inspection of the location or disposition of the water lines, but can be confined to establishing the water uses on the premises, the existence of cross connections, and the availability of auxiliary or non-potable water supplies. On-site inspections are made of new and existing facilities and should any backflow prevention assembly or plumbing changes be required; a follow-up inspection will be made of the same facilities at a later date. See Chapter 10 for reclaimed water systems and Chapter 11 for irrigation systems as separate, known areas for surveys and inspections.

B. PROPOSED CONSTRUCTION

All construction plans and specifications for proposed new non-residential facilities shall be made available to the Authority's Engineering Department to determine the degree of potential hazard(s). At this time, backflow prevention requirements in accordance with this policy will be made.

C. CUSTOMER SERVICE

Upon application for water service, the Authority's Customer Service Department will obtain information in order to screen each new and existing account for potential hazard(s) in accordance with this policy. For new water service or continued existing water service, compliance with requirements pursuant to this policy must be achieved or the agreement for service contract will be terminated.

D. FREQUENCY

Due to changes in models or components of equipment, methods of manufacturing, and additions to plants, buildings, etc., water use requirements undergo continual change. As a result, new cross connections may be installed, and existing protection may be bypassed, removed, or otherwise ineffective; therefore, a detailed inspection of all water usage is required periodically.

E. AUTHORITY FOR INSPECTION

The Executive Director and other duly authorized employees of the Authority who are appointed by the Executive Director, bearing proper credentials and identification, shall be permitted to enter upon all properties for the purpose of sampling and testing of the water, or make inspections and observations of the connections to the public water supply system.

Refusal to allow inspection of any water using equipment, plumbing or other cross connections shall cause the Authority to require the installation of an approved backflow prevention assembly at the service connection or discontinue water service.

CHAPTER 7

NON-COMPLIANCE AND ENFORCEMENT

RESULTS OF NON-COMPLIANCE

An inspection report listing all potential hazard(s) to the Authority's potable water supply found during the inspection will be sent to the owner or authorized agent of the owner of the building or premises, stating that corrections must be made and setting a reasonable time for compliance. Upon failure of the owner or authorized agent of the owner of the building or premises to have the potential hazard(s) corrected by the specified time, the Authority may cause the water service to the building or premises to be terminated.

The Authority may cause discontinuance of water service if a backflow prevention assembly has been bypassed, failed to be tested or properly maintained as required by the Authority and/or this policy statement.

The Authority may also cause discontinuance of water service if an air-gap separation system is compromised.

In addition, the Authority may have the required backflow prevention assembly installed, tested, and/or repaired at the owner's expense. The cost of the device, test, and/or repair along with an administrative fee, will be charged to the customer/owner and appear on their utility bill.

ENFORCEMENT

The Executive Director shall endeavor to assure compliance with the requirements of this policy through education and awareness. If such efforts, over a reasonable period of time, are futile, the Executive Director, or his/her designee, shall take formal action as provided hereinafter.

In any case involving a person who has failed to comply with any provisions of these regulations the procedures shall be as follows:

a) The Executive Director or authorized representative shall give notice to such person by mail stating the specifics of the failure of compliance and requiring that the person remedy the failure by a specified date.

b) If, by the specified date, such person has not remedied the failure, the Executive Director may, without further notice, cause the water from the public system to be discontinued or alternatively, the Authority may, at their discretion, remedy the cross connection at the customer's expense. All expenses including, but not limited to, materials, supplies, staff time, travel time and administrative costs will be billed to the customer on their monthly water bill.

c) In any case where water service is discontinued for enforcement purposes, the restoration of such service shall be conditioned on full compliance and payment by such person of any expense incurred in the enforcement proceeding and in the restoration of service.

CHAPTER 8

PARTIAL LIST OF FACILITIES AFFECTED, CROSS-CONNECTION HAZARDS, AND PROTECTIVE ASSEMBLIES REQUIRED

Component II per 62-555.360 F.A.C.

A. PARTIAL LIST OF FACILITIES REQUIRING A BACKFLOW PREVENTION ASSEMBLY AT THE SERVICE CONNECTION

Abbreviations:

A/G	Approved Air-Gap
DCVA	Double Check Valve Assembly
DCDA	Double Check Detector Check Valve Assembly (an approved DCVA with a detector meter and small DCVA on a bypass)
RP (RPZ)	Reduced Pressure Principle Backflow Prevention Assembly
RPDA	Reduced Pressure Principle Detector Backflow Prevention Assembly (an approved RP with a detector meter and small RP on a bypass)

RP REQUIRED

The following types of plants or facilities have been found to contain cross connections which under adverse conditions constitute a serious potential health hazard to the public water system and will require the installation of a reduced pressure principle (RP) backflow prevention assembly by a certified plumber:

1. Aircraft and Missile Plants
2. Automotive Plants
3. Auxiliary Water Systems connected to lines or fixtures supplied by Authority's water
    i. Private Water Supply (including wells and cisterns)
    ii. "Used Water" and "Industrial Fluids"
4. Beverage Bottling Plants
5. Breweries
6. Buildings - Multi-story Hotels, Apartment Houses, Public and/or Private Buildings*, Nonresidential Multi-unit Buildings with four (4) or more units, or any other structures having unprotected cross connections
7. Canneries, Packing Houses, and Reduction Plants
8. Chemical Plants - Manufacturing, Processing and Compounding or Treatment
9. Chemically Contaminated Water System
10. Civil Works
11. Commercial Car Wash
12. Common Areas including Construction or Master Meters (i.e. campgrounds, trailer parks, etc.)
13. Cold Storage Plants
14. Film Laboratories
15. Fire Systems (See Section C for exceptions and requirements)
16. Hospitals, Medical Buildings, Sanatoriums, Morgues, Mortuaries, Autopsy Facilities, Nursing and Convalescent Homes and Clinics*
17. Irrigation System (Commercial or Residential when not installed to plumbing code or when utilizing pumps and/or chemicals)
18. Islands served by a Subaqueous Service or Main

19. Large Boilers or Hot Water Systems; Steam Generating Equipment
20. Laundries and Dye Works* (not including self-service laundromats except where such equipment constitutes a cross connection)
21. Metal Manufacturing, Cleaning, Processing, and Fabricating Plants
22. Motion Picture Studios
23. Oil and Gas Production, Storage or Transmission Properties
24. Paper and Paper Product Plants
25. Plating Plants
26. Power Plants
27. Radioactive Materials or Substances - Plants or Facilities Handling
28. Restaurants, Commercial Food Preparation*
29. Restricted, Classified, or Other Closed Facilities
30. Rubber Plants - Natural or Synthetic
31. Sand and Gravel Plants
32. Schools and Colleges* (See Section B item 9)
33. Sewage and Storm Drain Facilities
34. Waterfront Facilities (Commercial) and Industries (Marina, Dock Service, etc.). (See Section B item 5)
35. Water Loading Systems (Temporary or permanent for filling trucks, construction, etc.)

*A Double Check Valve Assembly or Neptune T-10 DC Meter may be permitted based on an on-site hazard assessment by the Authority's Water Quality Division.

DCVA REQUIRED

The facilities with cross connections which under adverse conditions constitute a potential pollution hazard to the public water system require the installation of a double check valve backflow prevention assembly by a certified plumber for 1" and larger meters. The following facilities are included in this category:

1. Low-Hazard Facility
2. Residential Irrigation System meets Florida Plumbing Code 608.16.15, including installation of a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker (AVB) as required, no pumps are utilized, and no chemicals are fed into the irrigation system.
3. Waterfront Facilities and Industries
4. Multi-Story or Nonresidential Multi-Unit Facility

NEPTUNE T-10 DOUBLE CHECK METER REQUIRED

The facilities with cross connections which under adverse conditions constitute a potential pollution hazard to the public water system require the installation of the Neptune T-10 Double Check meter by the Authority for 5/8 " meters only. The following facilities are included in this category:

1. Auxiliary Water Supply **NOT** connected to lines or fixtures supplied by the Authority's water (pool, cistern, well)
2. Residential Irrigation System meets Florida Plumbing Code 608.16.15, including installation of a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker (AVB) as required, no pumps are utilized, and no chemicals are fed into the irrigation system.
3. Waterfront Facilities (Residential) and Industries – low hazard (See Section B item 5)
4. Low-Hazard Facility

The above lists may not be all inclusive. Omission from the list does not necessarily mean that a specific level of backflow protection is not required.

The facilities identified with no potential hazards require the installation of the dual check valve by the Authority for 5/8" thru 2" meters.

***IMPORTANT NOTICE**

Installations Requiring Continuous Service: Parallel Installation

All backflow prevention assemblies will be tested per the frequency schedule in Table 9.1 except for dual check valves which will be serviced as required and replaced with a new or rebuilt dual check valve as part of meter change-out. Testing requires a water shutdown usually lasting five (5) to twenty (20) minutes. For facilities that require an uninterrupted supply of water, and when it is not possible to provide water service from two meters, provisions should be made for a "parallel installation" of backflow prevention assemblies. A backflow prevention assembly of equivalent or greater protection shall be installed on the bypass. During testing one assembly is left on while the other is being tested. Each meter assembly requires a separate backflow preventer.

The Authority will not allow an unprotected bypass around a backflow preventer when the assembly is in need of testing, repair, or replacement.

B. CROSS-CONNECTION HAZARDS AND ASSEMBLIES SITE SPECIFIC CONSIDERATIONS

1. All Hospitals shall have an RP installed on all main service connections supplying potable water to such premises.

2. Medical Buildings, Sanitariums, Morgues, Mortuaries, Autopsy Facilities, Nursing and Convalescent Homes and Clinics shall have an acceptable RP, installed at the service connection. The hazards normally to be found in a facility of this type include cross connection between the customer’s water system and the contaminated or sewer-connected equipment such as bedpan washers, flush valve toilets and urinals, autoclaves, specimen tanks, sterilizer, pipette tube

washers, cuspidors, aspirators, autopsy and mortuary equipment.

NOTE: Protection through isolation of the premises is critical where little or no attention is given to the maintenance of air-gap separation, which is often compromised. Also, in multi-story buildings, the supply line to the toilets, urinals, lavatories, laboratory sinks, etc., on the lower floors may be taken off of the suction side of the house pump and as a result, sewage or other contaminated substances may be drawn into the house supply line.

3. All buildings, industrial plants, residences, or other structures having an auxiliary source of water (i.e. private wells, cisterns) connected to lines or fixtures supplied by Authority' water, shall have an RP installed at the main service connection supplying potable water to such premises.

4. All nonresidential buildings, hotels, apartment houses, with two (2) or more units, public and private buildings, or other structures shall have an acceptable A/G, RP, or DCVA, (depending upon the degree of hazard) installed at the service connection if the buildings have unprotected or inadequately protected cross connections, sewage plumbing facilities, auxiliary water supplies, large boilers, or other like sources of contamination which could create a potential hazard to the public water system. Also, an approved backflow prevention assembly shall be installed at the service connection at any premises where there are existing cross connections or where the customer can make piping or equipment changes which would result in a cross connection.

5. All water front facilities and industries shall have an RP, or an acceptable A/G or DCVA, depending upon the degree of hazard, installed at the service connection to any premise where water from the harbor, bay, river, stream, irrigation ditch, canal, lake, etc., is available to be used on the premises. Enhanced backflow protection may not be required on services to cafes, private residences, concessions, administration buildings, comfort stations, and other similar facilities which do not have outlets available for supplying water to docks or facilities which have no use for such auxiliary water supplies for irrigation, fire protection, air conditioning, cooling, swimming pool supply or other such purposes. (NOTE: The foregoing exemption will not be valid if backflow prevention is required because of some other potential or existing hazard).

6. All manufacturers of chemicals shall have an acceptable A/G or RP, depending upon the degree of hazard, installed at the main service connection supplying potable water to such premises.

7. All Sewage Treatment Plants shall have an acceptable A/G or RP installed on main potable water service lines serving such plants.

8. Cold Storage Plants shall have an acceptable A/G, RP or DCVA, depending upon the degree of hazard, on the service connection to any premises where such a plant has on the premises an auxiliary water supply, industrial fluid system, sewage handling facilities or other similar source of contamination which if cross-connected to, would create a hazard to the public system. The hazards normally to be found in plants of this type include cross connections between the customer's water system and reservoirs, cooling towers, and circulating systems which may be heavily contaminated with bird droppings, vermin, algae, bacterial slimes, or with toxic water treatment compounds.

9. Schools and Colleges shall have an acceptable A/G, RP or DCVA, depending upon the degree of hazard, installed at the service connection where water is used to supply chemical, bacteriological, and biological laboratories; or where the water is used to supply separate irrigation systems; or where there are unprotected sewer cross connections.

NOTE: This hazard is critical because little or no attention is given to the maintenance of vacuum breakers and frequently they are removed from the line; steam generating facilities and lines are frequently contaminated with boiler compounds such as pentachlorophenol, cyclohexyl-amine, etc. A very particular hazard is the possibility of steam getting back into the domestic system, causing either a system or a health hazard.

10. At Commercial Car Washing Installations, the potable make-up water lines to reclaim water pits shall have an A/G separation. All potable water connections to fluids such as bug cleaner, wax and soap solutions make-up tanks shall have an A/G separation. If this is not possible due to the design of the equipment, an RP shall be installed on the main water supply line at the service connection.

11. At all buildings or premises where security requirements or other prohibiting restrictions make it impossible or impractical to make a complete inside cross-connection survey, the public water system shall be protected against backflow from the premises or building by an RP installed on the main service connection(s) serving the building or premises.

NOTE: Any device, equipment or situation not covered by this cross-connection policy where water is connected or used, which may constitute a potential health hazard will be handled at the discretion of the water purveyor or his authorized agent.

C. FIRE SYSTEMS

All fire-suppression systems are potential hazards. Where there is a high hazard, such as a risk of chemical addition, an RP is required. Systems with an auxiliary supply available

or located within 1700 feet of the premises may, at the discretion of the Engineering Department, require the installation of an RP or RPDA. All others require a DC if metered, or a DCDA if unmetered.

1. The customer shall install and maintain a DCDA or RPDA backflow preventer on all unmetered fire systems.

2. DCDA or RPDA must be installed above ground to provide ease of maintenance and meter accessibility. The FKAA will inspect these backflow preventers for proper installation.

3. All DCDA's or RPDA's must be tested with satisfactory test forms submitted to the Authority upon installation and annually, thereafter, and repaired within 30 days, if needed, by a certified Florida Fire Sprinkler Contractor.

4. All the above installations must be inspected and approved by the Engineering Department prior to activation of service.

CHAPTER 9

INSTALLATION, TESTING AND REPAIR OF BACKFLOW PREVENTERS

Component III per 62-555.360 F.A.C.

I. REQUIREMENTS FOR INSTALLATION, TESTING, REPAIR OF BACKFLOW PREVENTERS

Based on inspections and field evaluation of water uses on existing customer accounts and plan reviews on new customer accounts, the Authority shall determine the type of backflow protection required based on type of hazard and meter size.

Where the meter size and hazard warrant, the Authority shall own, install, test, and repair Neptune T-10 Double Check Meter. For new meter installations, the cost of the Neptune T-10 Double Check shall be the responsibility of the customer. If the FKAA identifies an existing Neptune meter that requires an upgrade to a Neptune T-10 Double Check meter, the Authority shall replace the meter at the Authority's expense.

Where a Neptune T-10 Double Check meter will not provide sufficient protection, the appropriate backflow assembly shall be installed, owned, tested, maintained, repaired or replaced as needed at the customer's expense. These assemblies include, but are not limited to, RPs and DCVAs. Backflow assemblies which are part of a fire protection system shall be installed, tested, maintained, repaired and replaced as needed by a certified fire protection system contractor pursuant to Chapter 633, Florida Statutes.

II. ASSEMBLY INSTALLATION REQUIREMENTS

The list of acceptable backflow prevention assemblies and detailed drawings that show FKAA requirements for the installation of the backflow prevention assemblies are available upon request from the Authority's Engineering Department. These requirements are in addition to the manufacturers recommendations for the proper installation of these assemblies.

DESCRIPTION OF APPROVED AND ACCEPTABLE BACKFLOW PREVENTERS

To be approved by the Authority, these assemblies must be readily accessible for in-line testing and installed on the customer's property as close to the meter as practical (within 10 feet of meter or right-of-way) and in a location where no part of the assembly will be submerged. All potable water from the Authority's water supply system must pass through the assembly. The assembly must not be bypassed. Initial testing of the assembly must be completed at the time of installation. Coordination with FKAA staff may be required to obtain water service for initial testing on locked meters. Contact the Water Quality Department at (305) 295-2173 or the Water Quality Manager at (305) 295-2219 to coordinate.

The following information shall be forwarded to the Authority immediately by the customer or the installer after the installation of all testable backflow assemblies:

1) Service address where the assembly is located
2) Owner
3) Description of assembly(s) location on the premises
4) Date of installation
5) Type and size of assembly installed

6) Manufacturer
7) Model number of the assembly
8) Serial number of the assembly
9) Meter number
10) Completed Initial test results form

Inspection of the installation by the Authority is required before approval.

III. TESTING SPECIFICATIONS

FKAA utilizes automatic meter reading (AMR) and advanced metering infrastructure (AMI) technology in combination with Neptune T-10 and T-10 Double Check meters throughout the system. This technology provides for immediate communication of detailed consumption profile information as well as alerts for leak or backflow to the utility. Neptune T-10 meters are read at 15-minute intervals, enabling key data such as backflow flags to be transmitted as soon as they are registered. Backflow events (including occurrence date and time) can be identified quickly with AMI and proactively addressed.

Additionally, monthly reports are generated for any backflow events >10 gallons. All of the devices on the Monthly Backflow Report are reviewed, flagged locations are visited, and meters are tested, repaired, or replaced as necessary.

Neptune 5/8" T-10 Double Check meters utilized by the Authority for intermediate hazard situations have the capacity to offer 15-minute interval reverse flow monitoring to ensure that the device is functioning properly. In normal flow conditions, the independently operating check valves remain closed until there is a demand for water. The T-10 Double Check backflow meter is approved by the ASSE (American Society for Sanitation Engineering) 1015 and is rated as a 1⁄2" backflow device.

A. Testing Frequency

All backflow preventer assemblies required at or for non-residential service connections shall be tested after installation or repair and at least annually thereafter and shall be repaired if they fail to meet performance standards.

In addition to regular testing per the schedule in Table 9.1, all backflow preventer assemblies, including Neptune T-10 Double Check Meters, required at or for residential service connections, shall be tested prior to or at the time of installation, following repair, and as indicated per AMI reports. T-10 Double Check meters shall be serviced and tested every seven years or replaced in conjunction with FKAA's meter change-out program schedule. The meter change-out program schedule is dependent upon the size of the meter, the age of the meter, and the flow as registered. Testing of a percentage of T-10 Double Check meters in the system, chosen at random, shall be performed periodically. All meters shall be repaired or replaced if they fail to meet performance standards at any time.

Residential service connections are any service connections, including dedicated

irrigation or fire service connections that are two inches or less in diameter and that supply water to a building, or premises containing only dwelling units. All other service connections are non-residential service connections.

Table 9.1 Backflow Device Testing Frequency

Backflow Device Testing Frequency Chart (years)	T-10 DC (XANP)	RP/DC Assembly
	RESIDENTIAL	
W RES	7 (or AMI flag)	2
W IRRIGATION	7 (or AMI flag)	2
*W RECLAIMED	7 (or AMI flag)	2
W FIRE	na	2
	NONRESIDENTIAL	
W NONRES	1	1
W IRRIGATION	1	1
W RECLAIMED	1	1
W FIRE	na	1
FKAA-OWNED/INCL NAVY	1	1
All devices require an initial test at install * Domestic service connection backflow to be tested upon install of Reclaimed		

B. Testing Requirements

Testing of approved assemblies shall be performed by a certified backflow prevention assembly technician, or for assemblies connected to fire lines, by a certified Fire Protection System Contractor I or II pursuant to Chapter 633, Florida Statutes.

Initial testing of newly-installed backflow prevention assemblies is to be completed by the plumber/installer or a certified backflow prevention assembly technician at the time of installation and prior to, or in coordination with, the FKAA inspection.

Testing of T-10 Double Check meters shall be performed in-house, by certified backflow prevention assembly testers and/or technicians.

For those customers responsible for the testing of the backflow prevention assembly installed downstream of meter or meter assembly or on separate fire line systems, the Authority will notify the customer thirty (30) days in advance of when the test is required and furnish the customer with the necessary test form(s) and instructions.

For newly-installed assemblies connected to fire lines which have not yet been activated, a certified backflow prevention assembly technician may perform the initial test and inspection.

C. Testing Procedures

The Authority, certified backflow tester, or certified fire sprinkler contractor will notify the customer prior to water service being shut-off to perform testing.
The test form(s) shall be completed and returned to the Authority no later than the test month specified on the test form.

Test/Repair tags should be securely fastened to each assembly, this tag should indicate:

1. Date of test
2. Name of company
3. Name and registered number of certified tester

Tags should be of suitable material for a working life of at least five years without deterioration.

IV. REPAIR OR REPLACEMENT SPECIFICATIONS

All repairs shall be conducted by a certified plumber/certified backflow prevention assembly technician, a certified fire sprinkler contractor (for Backflow Connected to Fire Lines) or other persons approved by the Authority to make such repairs at the customer's expense. All repairs must be made with manufacturer's approved replacement parts. After repairs or replacement, the assembly(ies) must be tested and test forms submitted to the Authority.

The Authority shall be notified of any repair which cannot be performed immediately. The repair of the malfunctioning backflow preventer shall be made within 5 business days of discovery or test.

The Authority shall be notified immediately of the necessary replacement of any un-repairable backflow preventer. The replacement of the un-repairable backflow preventer shall be made within 5 days of discovery or test.

All dual check devices (DuCs) required at service connections from the Authority shall be refurbished or replaced at least once every 15 years or after 1.5 million gallons of flow, or as necessary based on data from backflow sensing meters at service connections.

V. CERTIFICATION OF BACKFLOW PREVENTION ASSEMBLY TESTERS

A person wishing to become certified as a Backflow Prevention Assembly Tester must complete a comprehensive training program established by the University of Florida TREEO Center or equivalent as approved by the Authority.

VI. THE AUTHORITY'S LIST OF APPROVED BACKFLOW ASSEMBLY TESTERS

If an individual wishes to be placed on the Authority's List of Approved Backflow Prevention Assembly Testers, he must submit his request in writing to the Authority's

Engineering Department with a copy of his TREEO Center Certificate of Completion or similar course as accepted by the Authority. The Authority shall notify the individual in writing as to his approval or denial.

VII. CAUSE FOR REMOVAL FROM THE AUTHORITY'S LIST OF APPROVED BACKFLOW ASSEMBLY TESTERS

Any person who has received in writing from the Executive Director or his authorized representative permission to test backflow prevention assemblies required by the Authority may have his name removed from the Authority's list of Approved Backflow Assembly Testers for any of the following:

*Incompetence and willful violation of the policies set forth in this manual or applicable plumbing code

*Failure to maintain and submit recertification verification to the Authority

*Unsatisfactory field test procedures or invalid test form results

Prior to removal, the tester shall receive notification of the Authority's intent and will be given time to present evidence in defense before the Executive Director or his authorized representative. The Executive Director shall have a right of final decision and shall notify the tester in writing of such decision.

CHAPTER 1O

RECLAIMED WATER
CROSS-CONNECTION CONTROL

Cross connections to the potable water system are prohibited.

I. BACKFLOW REQUIREMENTS

All properties served by reclaimed water must have the appropriate backflow protection installed. For residential properties, a minimum of a Neptune T-10 Double Check Meter (T-10 DC) or DCVA must be installed prior to service being provided. For non-residential properties, a Reduced Pressure Backflow Prevention Assembly (RP) must be installed. Devices must be inspected as specified in the manual.

II. INSPECTION REQUIREMENTS

Inspections will be completed by the Authority when reclaimed service is initiated and periodically thereafter, concurrent with the T-10 DC meter or backflow device testing schedule in Table 9.1. Inspections will be completed to ensure proper connections, minimize illegal cross connections and verify proper use of reclaimed water.

Inspections will consist of:

- Customer notification
- Visual check for Cross-connection
- Verify backflow device is installed and working properly/or recently tested
- Physical check of all hose connections/locked/signed
- Check to ensure all reclaimed water valves and outlets are appropriately labeled
- Check reclaimed meter marked for reclaimed water
- Verify with water test that potable fixtures are not served by reclaimed water and reclaimed fixtures are not served by potable water.

Inspectors will complete a Reclaimed Inspection Form and a Reclaimed Inspection Notice, the latter of which will be left with the customer.

III. PUBLIC NOTIFICATION

For public access areas such as golf courses, cemeteries, parks, landscape areas, hotels, motels and highway medians visible advisory signage shall be posted where reclaimed is practiced. Signage shall meet the requirements of section 62-610.468 of the Florida Administrative Code and shall include the text “Do Not Drink” in English and Spanish. Storage ponds and decorative water features shall also bear the words “do not swim” in English and Spanish.

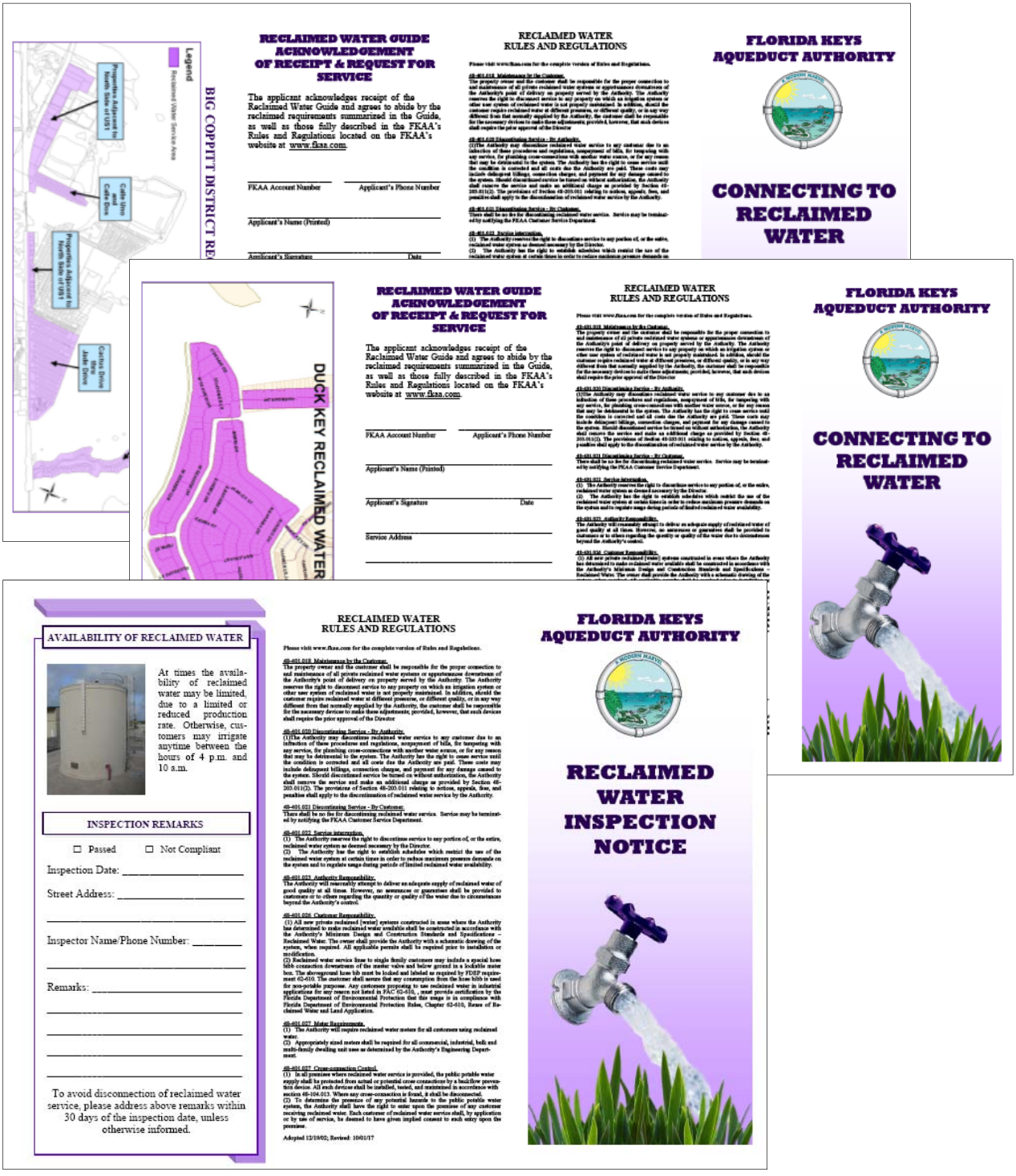
For non-public access areas all vaults, service boxes, or compartments that house hose bibs along with all labels on hose bibs, valves, and outlets shall bear the words “do not drink” and “no beber” along with the equivalent standard international symbol.

IV. RECLAIMED CUSTOMER EDUCATION

Reclaimed water customers will receive a copy of the Authority’s “Connecting to Reclaimed Water” brochure upon initial connection to reclaimed water and when reclaimed water service is transferred to a new customer. During periodic inspections, customers will receive

a “Reclaimed Inspection Notice” to ensure that users of reclaimed water are informed about the origin, nature, and characteristics of reclaimed water; the manner in which reclaimed water can be safely used; and limitations on the use of reclaimed water.

Brochures are available by request in the Water Quality Department or at www.FKAA.com.



CHAPTER 11

IRRIGATION
CROSS-CONNECTION CONTROL

I. IRRIGATION SYSTEMS

Irrigation systems are considered a potential hazard for a variety of reasons. Most systems are constructed of materials that are not suitable for use with potable water. Sprinklers, bubbler outlets, emitters and other equipment are exposed to substances such as fecal material, fertilizer, pesticides and other chemical and biological contaminants. Sprinklers often remain submerged under water after system use or storms. They may be subject to various onsite conditions such as additional water supplies, chemical injection, booster pumps and elevation changes.

II. BACKFLOW PROTECTION REQUIRED

RESIDENTIAL IRRIGATION, 5/8" METER

Hazard	Protection
Irrigation w/ Chemicals	RPZ
Irrigation w/ Pumps	RPZ
Irrigation Only	T-10 DC Meet Plumbing Code*

*All irrigation systems must meet Florida Plumbing Code 608.16.5, including installation of a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker as required.

RPZ = Reduced Pressure Zone Assembly

The FKAA installs a 5/8" Neptune T-10 Double Check (T-10 DC) meter for all irrigation applications that do not require an RPZ. This meter is tested regularly by the FKAA at no additional expense to the customer.

Appropriate backflow protection requirements for meters greater than 5/8" will be evaluated through the Authority's Engineering Division.

See Table 11.1 at the end of this chapter for additional device requirement information.

III. INSTALLATION OF PVB/AVB

As set forth in Section 608.16.5 of Florida Plumbing Code, a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker (AVB) must be installed on irrigation systems not protected by an RPZ or air gap. In addition, hose bibs should have vacuum breakers as well. AVBs must be installed 6 inches above downstream piping and outlets and no control valves are allowed downstream of (after) the AVB.

The proper use of pressure vacuum breakers (PVB) require that they be installed above all downstream piping and outlets. This eliminates the potential of backpressure. If the downstream piping or outlets are above the vacuum breaker, then the resulting backpressure may flow back (backflow) through the vacuum breaker. The PVB must be installed 12 inches above the downstream piping and outlets. Manufacturer's instructions should always be followed.

IV. IRRIGATION CUSTOMER RESPONSIBILITIES

Customers with irrigation systems not connected to pumps or chemicals are simply required to ensure that the AVB/PVB is installed and operating correctly.

Residential customers with irrigation systems connected to chemicals or pumps are required to ensure that the RPZ is installed, operating correctly, and tested every two years. Non-residential customers with irrigation systems connected to chemicals or pumps are required to ensure that the RPZ is installed, operating correctly, and tested annually.

To comply with cross connection control regulations, the FKAA is required to keep the meter locked until appropriate backflow devices are installed and in proper working order. After the customer has notified the Engineering department that their irrigation system and backflow device are ready for inspection, they should allow up to 48 hours for FKAA staff to conduct a cross connection control inspection and unlock the meter.

A "Cross Connection Control for Residential Irrigation Systems" brochure, shown Section VII, is available for customers, providing detailed information about cross connection control requirements and customer responsibilities. These are available at www.FKAA.com.

V. FKAA IRRIGATION METER PROGRAM

Customers with excessive water use that does not return to the wastewater system may want to take advantage of the FKAA Irrigation Meter Program. Wastewater charges are not assessed on consumption through a verified FKAA irrigation meter. Customers must complete and sign an irrigation meter application as shown in Section VII.

VI. INSPECTION REQUIREMENTS

Inspections will be completed by the Authority when an irrigation system is installed, a backflow device is installed or changed on an irrigation system, or when an irrigation meter is installed. Inspections will be performed periodically thereafter, concurrent with the backflow device testing schedule. Inspections will be completed to ensure proper connections, minimize illegal cross connections and verify proper use of irrigation system.

Inspections will consist of:

- Customer notification
- Visual check for Cross-connection
- Verify backflow prevention device is installed and working properly/or recently tested
- Physical check of all hose connections

VII. DOCUMENTS

FKAA IRRIGATION METER FOR RESIDENTIAL SINGLE FAMILY

I am requesting an irrigation meter and understand that this water will not be returned back into the wastewater systems. Below are some examples for the purpose of irrigation meters;

- Landscape watering or water for the purpose of growth of lawns, shrubs, trees or edible crops;
- Swimming Pool filling/refilling with no bathrooms attached;
- Hose bibs for wash downs of vehicles, boats, or pressure cleaning purposes;
- Docks with no bathrooms attached;
- Ornamental fountains;
- Ice machines.

I agree to pay the current fees due for this irrigation meter.

I understand that the plumbing connected to this meter must meet Section 608.16.5 of Florida Plumbing Code, including the installation of a Pressure Vacuum Breaker (PVB) or Atmospheric Vacuum Breaker (AVB) as necessary for irrigation systems. **Most irrigation systems will require a PVB.**

- AVBs must be installed 6" above downstream piping and outlets, and no control valves are allowed downstream of (after) the AVB.
- PVBs must be installed 12" above downstream piping.

Please consult a licensed plumbing contractor if you have any questions about the required device.

Meters will remain locked until plumbing connected to the meter meets code and appropriate backflow prevention devices have been installed (if required). Contact FKAA at **(305) 296-2454** to request a final inspection and have the meter unlocked. Please allow up to 3 business days to complete the inspection.

In the event of any change of use for this meter from an irrigation meter to any other purpose, the FKAA must be notified.

_____ _____

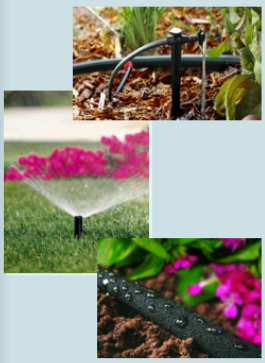
Signature Date

_____

Location Account Number

FLORIDA KEYS AQUEDUCT AUTHORITY

Cross Connection Control for Residential Irrigation Systems



www.fkaa.com

Irrigation systems

Irrigation systems are considered a potential hazard for a variety of reasons. Most systems are constructed of materials that are not suitable for use with potable water. Sprinklers, bubbler outlets, emitters and other equipment are exposed to substances such as fecal material, fertilizer, pesticides and other chemical and biological contaminants. Sprinklers often remain submerged under water after system use or storms. They may be subject to various onsite conditions such as additional water supplies, chemical injection, booster pumps and elevation changes.

Submerged Sprinkler Head

The FKAA strongly supports conservation measures such as the utilization of cisterns, rain barrels and Florida Friendly landscaping. For more information please contact Shelli Johnson at the contact information provided.

Protecting the Public Water Supply

The Florida Keys Aqueduct Authority is committed to safeguarding the public water supply from contamination. As required by Federal and State regulations the Authority has developed a Cross Connection Control Program to ensure the water supply is protected.

A critical component of this program is to ensure that appropriate backflow protection is installed based on the hazard existing on the property.

A reverse flow of water from the a private system back into the potable water system is called backflow. Backflow can occur due to backpressure and/or backsiphonage conditions.

Installation of adequate backflow protects both you and your neighbors.

Florida Keys Aqueduct Authority

Shelli Johnson
Water Quality & Env. Manager
Email: sjohnson@fkaa.com
Phone: (305) 295-2219

Residential Irrigation Cross Connection Control

Proper Installation of PVB/AVB

As set forth in Section 608.16.5 of Florida Plumbing Code a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker (AVB) must be installed on irrigation systems not protected by an RPZ or air gap. In addition, hose bibs should have vacuum breakers as well.

AVBs must be installed 6 inches above downstream piping and outlets and no control valves are allowed downstream of (after) the AVB.

The proper use of pressure vacuum breakers (PVB) require that they be installed above all downstream piping and outlets. This eliminates the potential of backpressure. If the downstream piping or outlets are above the vacuum breaker, then the resulting backpressure may flow back (backflow) through the vacuum breaker. The PVB must be installed 12 inches above the downstream piping and outlets.

Pressure Vacuum Breaker (PVB)

Manufacturers instructions should always be followed.

BACKFLOW PROTECTION REQUIRED
RESIDENTIAL IRRIGATION
5/8" METER

Hazard	Protection
Irrigation w/ Chemicals	RPZ
Irrigation w/ Pumps	RPZ
Irrigation Only	T10-DC Meet Plumbing Code*

*All irrigation systems must meet Florida Plumbing Code 608.16.5, including installation of a Pressure Vacuum Breaker (PVB) or an Atmospheric Vacuum Breaker as required. More information on these devices is located at left.

The FKAA installs a Neptune T10 Double Check (T10-DC) meter for all irrigation applications that do not require an RPZ. This meter is tested regularly by the FKAA at no additional expense to the consumer.

Appropriate backflow protection requirements for meters greater than 5/8" will be evaluated through the Authority's Engineering Division.

RPZ = Reduced Pressure Zone Assembly

Customer Responsibilities

- Customers with irrigation systems not connected to pumps or chemicals are simply required to ensure that the AVB/PVB is installed and operating correctly.
- Customers with irrigation systems connected to chemicals or pumps are required to ensure that the RPZ is installed, operating correctly, and tested every three years.

To comply with cross connection control regulations, the FKAA is required to keep the meter locked until appropriate backflow devices are installed and in proper working order. Please allow up to 48 hours for FKAA staff to conduct a cross connection control inspection and unlock the meter.

FKAA Irrigation Meter Program

Customers with excessive water use that does not return to the wastewater system may want to take advantage of the FKAA Irrigation Meter Program. Wastewater charges are not assessed on consumption through a verified FKAA irrigation meter. Please call (305) 296-2454 for more information.

Table 11.1 FKAA Minimum Backflow Device Requirements

FKAA Minimum Backflow Device Requirement	5/8" Meter		1"+ Meter	
POTABLE METER	**RESIDENTIAL**	**NONRESIDENTIAL**	**RESIDENTIAL**	**NONRESIDENTIAL**
No Potential Hazards	Dual Check		Dual Check	
Low Hazard (waterfront, AWS (pool, cistern, well))	T-10DC		DCVA (or RP)	
Irrigation System (no pumps or chemicals)	T-10DC **and** AVB/PVB to code* (or RP)		DCVA **and** AVB/PVB to code* (or RP)	
Irrigation System (with pumps or chemicals)	RP		RP	
High Hazard Facilities listed in CCC Manual (Ch 8 p 28)	RP		RP	
Automatic fill to AWS (pool)	Air Gap to code* or RP		Air Gap to code* or RP	
IRRIGATION METER	**RESIDENTIAL**	**NONRESIDENTIAL**	**RESIDENTIAL**	**NONRESIDENTIAL**
Low Hazard (hose bibs only, no irrigation system)	T-10DC and HBVB		DCVA (or RP) and HBVB	
Irrigation System (no pumps or chemicals)	T-10DC **and** AVB/PVB to code* (or RP)		DCVA **and** AVB/PVB to code* (or RP)	
Irrigation System (with pumps or chemicals)	RP		RP	
Automatic fill to AWS (pool)	Air Gap to code* or RP		Air Gap to code* or RP	

Blue text - FKAA-owned and tested

All devices require an initial test at install

RESIDENTIAL DCVAs and RPs tested every 2 years

NONRESIDENTIAL DCVAs and RPs tested annually

*** Florida Plumbing Code Section 608.16.5**

HBVB - Hose Bib Vacuum Breaker- Should be installed on all hose bibs.

PVB - Pressure Vacuum Breaker- Must be installed upright, 12 inches above highest downstream piping and outlets, and tested upon installation or repair.

AVB - Atmospheric Vacuum Breaker- Must be installed upright, 6 inches above highest downstream piping and outlets, and on the non-pressure side of the last control valve. No control valves allowed downstream.

DCVA - Double Check Valve Assembly- May be installed below the ground. Must be tested at installation or repair, and regularly per FKAA policy.

Air Gap- Separation twice the diameter of the water outlet (minimum 1").

RP or RPZ - Reduced Pressure Zone Assembly- Must be installed a minimum of 12" above the ground and tested at installation or repair, and regularly per FKAA policy.

CHAPTER 12

ASSEMBLY INSTALLATION DETAILS, FORMS AND LETTERS

Assembly installation details, program forms and letters are available upon request from the Authority's Water Quality Division.

CHAPTER 13

PROGRAM RECORDS

Component V per 62-555.360 F.A.C.

PROGRAM RECORDS

A. The Authority will maintain, in either electronic or paper format, a current inventory of all backflow protection required at or for service connections from the Authority. The inventory will include the following for each service connection where backflow protection is required:

- The service connection number (location ID);
- The service connection address;
- The service connection type (i.e., non-residential or residential) and subcategory (standard, dedicated irrigation, or dedicated fire);
- The location of the backflow protection at/for the service connection;
- The type of hazard isolated (i.e., the category of customer);
- The date when backflow protection was initially installed at or for the service connection;
- The type of current backflow protection (i.e., air gap, reduced-pressure principle assembly, reduced-pressure principle detector assembly, pressure vacuum breaker assembly, double check valve assembly, double check detector assembly, or T-10DC;
- If the type of current backflow protection is a backflow preventer assembly, the size, manufacturer, model, serial number, and date installed; and

B. The Authority will maintain, in either electronic or paper format, records of the installation, inspection/testing, and repair of all backflow protection required at or for service connections from the Authority.

The inventory will include the date when backflow protection was initially installed at or for any service connection where backflow protection is required. Also, the inventory will include the date when any current backflow preventer assembly or any current T-10DC was installed. Furthermore, if any T-10DC is refurbished (instead of replaced), the inventory will include the date the T-10DC was refurbished.

Records of the inspection of air gaps (AGs) required at or for service connections from the Authority will be maintained by keeping either an electronic or paper copy of AG inspection reports. Records of the testing and repair of backflow preventer assemblies required at or for service connections from the Authority will be maintained by keeping either an electronic or paper copy of backflow preventer assembly testing and repair reports. All AG inspection reports and all backflow preventer assembly testing and repair reports will be kept for not less than 10 years.

C. The Authority will prepare and submit CCC program annual reports. The first annual report will cover calendar year 2016, and subsequent annual reports will cover each calendar year thereafter. Each annual report will be prepared using the latest version of

Form 62-555.900 (13), Cross-Connection Control Program Annual Report. Each annual report will be submitted to the appropriate Department of Environmental Protection district office or Approved County Health Department within three months after the end of the calendar year covered by the report.

REFERENCES

A. MANUALS

Recommended Practice for Backflow Prevention and Cross Connection Control, AWWA Manual M14, second edition, 1990.

Accepted Procedure and Practice in Cross Connection Control, Pacific Northwest Section AWWA, 1973.

Manual of Cross-Connection Control, Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, 9th edition, 1993.

Cross Connection Control Manual, Division of Sanitary Engineering, Tennessee Department of Public Health, 1975.

Cross-Connection Control Manual, U.S. Environmental Protection Agency, 1973.

Cross-Connections and Backflow Prevention, AWWA, 1974.

Manual of Cross-Connections Control Policies, Tampa Water Department, Distribution Division, November 1983.

Manual of Cross-Connection Control, Gainesville Regional Utilities, 1985.

City of Jacksonville Cross-Connection Control Policy Manual, City of Jacksonville, Department of Public Works, Water Services Division.

B. DEVICE STANDARDS

AWWA C506-78, *AWWA Standards for Backflow Prevention Device, Reduced Pressure Principle and Double Check Valve Types*, 1978.

ASSE Standard #1001, *Pipe Applied Atmospheric Type Vacuum Breakers*, 1980.

ASSE Standard #1011, *Hose Connection Vacuum Breakers*, 1976.

ASSE Standard #1012, *Backflow Preventers with Intermediate Atmospheric Vent*, 1978.

ASSE Standard #1013, *Reduced Pressure Principle Backflow Preventers*, 1980.

ASSE Standard #1015, *Double Check Valve Type Back Pressure Backflow Preventers*, 1980.

ASSE Standard #1020, *Vacuum Breakers, Anti-Siphon, Pressure Type*, 1976.

ASSE Standard #1024, *Dual Check Valve Type Backflow Preventers for Carbonated Beverage Dispensers - Post Mix Types*, 1980.

USC, Foundation for Cross-Connection Control and Hydraulic Research, *Specifications of Backflow Prevention Devices*, 1995, (Note: Specifications included as Chapter 9 in Manual of Cross-Connection Control).

C. REGULATIONS, LAWS AND CODES

Public Law 93-523, *Safe Drinking Water Act*, December 16, 1974.

Rules of the Department of Environmental Protection, Chapter 62-555, Permitting and Construction of Public Water Supplies, May 2014.

Rules of the Department of Health and Rehabilitative Services, Division of Health, Chapter 10D-9, *Plumbing* and Chapter 10D-4, *Water Systems*.

Southern Building Code Congress International, *Standard Plumbing Code*, 1982, (with Amendments).

The National Fire Protection Association, *Installation of Sprinkler System*, NFPA No. 13.