



Orange County Utilities Cross Connection Control Manual November 2017 Revision 3



Introduction

Orange County Utilities (OCU) has had an active Cross Connection Control program for many years. The purpose of the program is to protect the potable water supply from contaminants and pollutants at the point of connection and to ensure that proper backflow preventers are installed where hazards exist. This program is comprehensive and applies to residential customers as well as industrial and commercial water customers. In addition, when OCU buys water from an adjacent utility or provides water to another utility, we ensure that the water system on both sides of the connection has an active and compliant cross connection control program.

The Orange County Utilities Cross Connection Control (CCC) Program contains seven elements required by state statutes. They include:

1. Legal authority for the CCC program
2. Policies establishing where backflow protection at service connections is mandatory because of actual or potential cross connections
3. Policies regarding ownership, installation, testing, & maintenance of backflow preventers (BP) at service connections
4. Procedures for assessing new or existing service connections to determine the need for the BPs at service connections
5. Procedures for record keeping related to the CCC program
6. Procedures for educating the public about CCC and backflow prevention
7. Procedures for investigating and responding to cross connection and/or backflow incidents

The program elements above are authorized by Chapter 37 of the Orange County Code and specific requirements for implementing these program elements are included in Chapter 37 and supporting documents including this manual, the Orange County Standards and Construction Specifications Manual, and the Orange County Plumbing code. These details and specifications of the cross connection control program are adopted and implemented by Orange County Utilities with support from the Orange County building department. Orange County Utilities will ensure that policies or procedures are uniformly implemented. Questions regarding either these CCC policies or procedures should be directed to the Orange County Utilities Water Division at (407) 836-6970 between the hours of 7:00 a.m. to 4:00 p.m. Questions related to the Orange County Plumbing Code, should be directed to the Orange County Division of Building Safety at (407) 836-5506.

Copies of this policy may be obtained from Orange County Utilities web site at:
<http://www.ocfl.net/CrossConnection>

Failure to comply with these requirements may result in suspension of water service until the situation is resolved.

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DEFINITIONS

Air gap (AG) - The unobstructed vertical distance through free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. These vertical, physical separations must be at least twice the diameter of the water supply outlet, never less than 1 in. (25mm). Local codes and regulations may have more stringent requirements.

Air gap fitting - A physical device engineered to produce an air-gap separation as defined above.

Approved - Accepted by the authority responsible as meeting an applicable specification as stated or cited in the ordinance, or as suitable for the proposed use.

Assembly - An assembly of one or more approved body components and including approved shutoff valves.

Atmospheric pressure - The pressure exerted by the atmosphere at any point. Such pressure decreases as the elevation of the point above sea level increases. One atmosphere is equivalent to 14.7 psi (101.4 kPa), 29.92 in. (760 mm) of mercury, or 33.9 ft. (10.1 m) of water column at average sea level.

Atmospheric vacuum breaker (AVB) - A backflow prevention device consisting of a float check, a check seat, and an air inlet port. A shutoff valve immediately upstream may be an integral part of the assembly. The device is designed to allow air to enter the downstream water line to prevent backsiphonage. This unit may never be subjected to a backpressure condition or have a downstream shutoff valve, or be installed where it will be in continuous operation for more than 12 hours.

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

Backflow - A hydraulic condition caused by differences in pressure that may cause non-potable water or another substance to flow into the potable water system.

Backflow preventer - An assembly, device or method that prevents backflow.

Backpressure - A pressure, higher than the potable water distribution pressure, caused by a pump, elevated tank, boiler, air/steam pressure, or any other means which may cause backflow.

Backsiphonage - Backflow caused by negative or reduced pressure in the supply piping.

Bypass - Any arrangement of pipes, plumbing, or hoses designed to divert the flow around an installed device through which the flow normally passes.

Certified backflow-prevention assembly tester - A person who is trained by a state training agency in backflow testing and is registered by the Orange County Building Division to test, repair, and maintain backflow-prevention assemblies.

Chemical - A substance obtained by a chemical process or used for producing a chemical reaction.

Consumer - The owner or operator having a service from a public potable water system.

Containment (policy) - To confine potential contamination within the facility where it arises by installing a backflow prevention assembly at the meter or curb stop.

Contamination - An impairment of a potable water supply by the introduction or admission of any foreign substance that degrades the quality and creates a health hazard.

Critical level - A reference line representing the level of the check valve seat within a backsiphonage control unit. It is used to establish the height of the unit above the highest outlet or flood rim.

Cross connection – Any unapproved or unprotected actual or potential connection or structural arrangement that is made between any part of the OCU water system or customer’s potable water system and any other source or system through which it is possible to introduce into any part of the potable water system and substances other than the intended potable water with which the system is supplied. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may change the color or add odors to the water. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur are considered to be cross connections.

Cross connection control- The enforcement of an ordinance or other legal statement regulating cross connections.

Cross connection control program- the policies and requirements for managing backflow preventers and connections to the water systems that all connections must follow related to the prevention and control of cross connections in the water system as specified and periodically updated by the Florida Department of Environmental Protection, Orange County Utilities Standards and Construction Specifications Manual, and the Orange County Cross Connection Control Manual.

Degree of hazard – the actual contamination or potential threat of contamination to the public water system or the customer’s potable water system related to cross connections to the public water system. The danger posed by a particular substance or set of circumstances. Generally, a low degree of hazard is one that does not affect health, but

may be aesthetically objectionable. A high degree of hazard is one that could cause serious illness or death.

Direct cross connection - Any arrangement of pipes, fixtures, or devices connecting potable water supply directly to a non-potable source; for example, a boiler feed line.

Distribution system - All pipes, fittings, and fixtures used to convey liquid from one point to another.

Double check valve assembly (DCVA) - An assembly composed of two independently acting, approved check valves, including tightly closing resilient-seated shutoff valves located at each end of the assembly and fitting with properly located resilient-seated test cocks. This assembly shall only be used to protect against a non-health hazard (that is, a pollutant).

Dual Check assembly (DuC)-An assembly composed of two internally loaded and independently operating check valves. This assembly can be used to stop backflow from backpressure and/or backsiphonage and shall only be used for low hazard applications such as reclaimed water irrigation.

Effective opening - The minimum cross-sectional area at the point of water supply discharge, measured or expressed in terms of the diameter of a circle, or if the opening is not circular, the diameter of a circle of equivalent cross-sectional area.

Flood level rim - That 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.

Health hazard - A cross connection or potential cross connection involving any substance that could, if introduced into the potable water supply, may cause death, illness, or spread disease, or have a high probability of causing such effects.

Internal isolation - Fixture isolation and/or isolation of an area or zone. Isolation at the fixture means installing an approved backflow preventer at the source of the potential contamination. Area or zone isolation is confining the potential source of contamination within a specific area.

Isolation (policy) - To confine a potential source of contamination to the non-potable system being served; for example, to install a backflow prevention assembly on the laboratory faucet or boiler feed line.

Negative pressure - Pressure that is less than atmospheric; negative pressure in a pipe can induce a partial vacuum that can siphon non-potable liquids into the potable distribution system.

Non-health hazard - A cross connection or potential cross connection involving any substance that generally would not be a health hazard but would constitute a nuisance, or be aesthetically objectionable, if introduced into the potable water supply.

Non-potable - Any liquid that is not considered safe for human consumption.

Orange County Utilities Standards and Construction Specifications Manual- the document by that title approved by the board identifying the minimum design standards and specifications, and review, approval and acceptance procedures to be used for the construction of water, wastewater and reclaimed water systems that will be maintained and operated by OCU. The manual applies to private development projects containing utility systems that will be dedicated to the county for operation and maintenance.

Plumbing - Any arrangement of pipes, fittings, fixtures and assemblies for the purpose of moving liquids from one point to another, generally within a single structure.

Poison - Substances that can kill, injure, or impair a living organism.

Pollution - The presence of any foreign substance in water that tends to degrade its quality so as to constitute a non-health hazard or impair the usefulness of the water.

Potable water - Water which according to recognized standards is safe for human consumption .

Potable water service- the provision of potable water from the county potable water system for use by a customer.

Potable water system-all facilities and interests real or personal property owned, operated, managed or controlled by the county, now and in the future and used to provide potable water service to existing and future customers.

Premises isolation - Preventing backflow into a public water system from a user's premises by installing a suitable backflow preventer at the user's connection.

Pressure vacuum breaker assembly (PVB) - An assembly consisting of an independently operating internally loaded check valve, an independently operating loaded air inlet valve located on the discharge side of the check valve, with properly located resilient-seated test cocks and tightly closing resilient-seated shutoff valves attached at each end of the assembly designed to operate under pressure for prolonged periods of time to prevent backsiphonage. The pressure vacuum breaker may not be subjected to any backpressure.

Reclaimed water – highly treated wastewater or other water sources meeting the requirements of Chapter 62-610, F.A.C., and which is suitable for direct, nonpotable, beneficial reuse.

Reclaimed water distribution system - A network of pipes, pumping facilities, storage facilities, and appurtenances in real and personal property owned, operated, managed or controlled by the county, now and in the future and used to convey reclaimed water to existing and future customers.

Reduced pressure principle backflow prevention assembly (RPBA) - The approved reduced-pressure principle backflow-prevention assembly consists of two independently

acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. These units are located between two tightly closing resilient-seated shutoff valves as an assembly and are equipped with properly located resilient-seated test cocks.

Residential Cross Connection Control Program- that portion of the Cross Connection Control Program established by OCU for testing and maintenance of backflow preventers applicable to residential customers who have an individually metered potable water connection and who are required to have a backflow preventer per the Cross Connection Control Program.

Service connection - A piping connection between the Orange County Utilities water or reclaimed system and a customer's system.

Water purveyor - The owner or operator of public, potable water system.

Abbreviations

ANSI	American National Standard Institute
ASME	American Standards of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
AWWA	American Water Works Association
CCC	Cross Connection Control
EPA	United States Environmental Protection Agency, Office of Water
FDEP	Florida Department of Environmental Protection
HRS	Florida Department of Health and Rehabilitative Services
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
OCPC	Orange County Plumbing Code (Southern Building Code Congress International, Inc.)
OCU	Orange County Utilities
OSHA	United States Department of Occupation Safety and Health Administration
USC-FCCC & HR	University of Southern California, Los Angeles, Foundation for Cross-Connection Control and Hydraulic Research

Section 1. Purpose & Legal Authority

PURPOSE

The purpose of a cross-connection control program is to prevent waterborne diseases and contaminants from entering the potable water system, thereby protecting the water that our customers use for many purposes including drinking. This manual is intended to provide our customers (both residential and commercial) and contractors with an understanding of:

1. cross connections and how Orange County identifies, prevents, and responds to them;
2. backflow preventer assembly requirements for properties that are connected to Orange County Utilities potable water system and the reasons for installing them;
3. site inspection and hazard assessment processes that are used to determine if a backflow preventer (and the appropriate type) is required for each connection; and
4. backflow preventer testing and maintenance requirements and responsibilities for Orange County Utilities' customers.

This manual covers the policies and procedures for our residential, industrial and commercial customer's related to backflow prevention and cross connection control. Effective implementation of the cross connection control program requires a coordinated effort between local plumbing officials, OCU, and OCU's customers. The policies, procedures, guidelines, and information presented in this manual are intended to support success in this objective.

LEGAL AUTHORITY

Orange County Utilities protects public health through the enforcement of requirements and standards for design, construction, operation and maintenance of the public potable water supply systems and reclaimed water systems. Cross connection as defined in Rule 62-550.200 F.A.C. is prohibited. The minimum requirements for cross connection control are also outlined by the State of Florida Department of Environmental Protection (FDEP) under chapters 62-550, 62-555 and 62-610 of the Florida Administrative Code; Chapter 4A-46, Division of State Fire Marshall, Fire Protection Contractors and Systems; Chapter 633, Fire Prevention and Control of the Florida State Statutes (F.S.); and the most current issue Florida Building Code / Plumbing and the Orange County Plumbing Code.

State law requires that Orange County Utilities as a public water supplier protect against backflow at or within their sources, treatment, storage and distribution facilities by complying with the recommendations in the American Water Works Association (AWWA) M14 manual including the installation of the appropriate backflow preventers based on the degree of hazard at the connection to the water system.

Community water systems and all public water systems that have service areas also served by reclaimed water systems regulated under Part III of Chapter 62-610, F.A.C., are required to implement a cross-connection control program to detect and control cross-connections and prevent backflow of contaminants into the water system. Rules concerning reclaimed water and its use are found in Chapter 62-610 of the F.A.C. and also within Orange County's Reclaimed Water Ordinance 94-21.

On August 29, 2017 Orange County Board of County Commissioners approved amendments to Orange County Code Chapter 37, Article I and Article III updating the requirements of the program and establishing a fee in support of this program for customers in the residential cross connection control program (RCCP). The residential program is limited to those OCU potable water customers that have a single metered potable water connection and require a backflow preventer due to the presence of an irrigation system, auxiliary source of water onsite such as an irrigation well, surface water source used for irrigation, residential fire sprinkler connection, or other identified hazard. Typically these connections are one inch diameter or smaller.

Commercial customers are also required to comply with the cross connection control program. Commercial connections may include industries such as hospitals or manufacturing facilities; commercial buildings including hotels and office buildings; apartment complexes and multifamily dwellings and homeowners associations with centralized irrigation systems or recreational complexes. As in the past under this program, commercial customers will continue to install, test, maintain and own backflow assemblies on the potable water system in accordance with the requirements in this document and the degree of hazard as defined in Tables 4-1 through 4-3.

Orange County Utilities Water Division and Orange County Building Division will ensure that the guidelines and procedures in this Manual are uniformly implemented.

Section 2: Policy & Backflow Principles

BACKFLOW PRINCIPLES:

To understand the policies and procedures in this manual it is important to understand some basic principles regarding control of cross connections and causes for backflow of contaminants into a water system.

A cross connection is any physical arrangement whereby a water supply is connected, directly or indirectly, with any other non-potable 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 contaminating 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. Ref. DEP rule 62-550.200 (27).

CAUSES OF BACKFLOW

Wherever there is a physical connection between a potable water system and a non-potable environment, backflow may occur from backsiphonage or backpressure.

Backsiphonage

Backsiphonage is backflow caused by negative or reduced pressure in the supply piping. Backsiphonage may occur when water main pressure is affected if water is withdrawn from a pipe at a very high rate. The utilities water supply pressure in the pipe may be reduced sufficiently to cause reversal of flow elsewhere in the system. If a connection to a contaminated source exists, backsiphonage could take place. This condition has the potential for being a very serious backflow incident. The backflow condition can be further aggravated by the addition of booster pumps either on the fire trucks or within a building's fire system.

Backpressure

Backpressure may cause backflow to occur whenever the utilities potable system is connected to a non-potable supply operating under a higher pressure by means of a pump, boiler, elevation difference, air or steam pressure, and so forth. There is a high risk that non-potable water may be forced into the potable system whenever these interconnections are not properly protected.

POLICY

As provided by county ordinance, Orange County Utilities has the authority to protect, operate, maintain and control all aspects of the water, wastewater and reclaimed water service connections to its customers. Connection to and extensions of the utility system shall be in accordance with these policies. To ensure the safety of the water systems, OCU has implemented requirements for backflow preventers to be installed at connections to the potable water system if there is a possibility that a cross connection or backflow incident could occur because of activities at the customer's premise or the presence of an auxiliary non-potable water supply. Some examples of auxiliary water supplies include reclaimed water, supplemental irrigation well, industrial processes, fire sprinkler systems and irrigation using a surface water source.

The type and location of the backflow preventer is determined based on the type of hazard associated with the connection to the water supply, the auxiliary water sources on-site and the use of the supply. Information about determining the type of hazard can be found in Section 3. When a customer connects to Orange County's potable water service, it is the customer's responsibility to properly install the water service line, the reclaimed service line and wastewater service lines on the customer's property and to connect such service lines or laterals to the OCU system in accordance with Orange County Utilities Standards and Construction Specifications Manual, OCU Cross Connection Control Manual, Orange County Building Code, Orange County Plumbing Code, and all other applicable codes and regulations. Typically these activities are performed by licensed plumbing contractors. The contractor connecting to the OCU system is responsible for obtaining all necessary permits and paying all necessary fees and charges to the building department as well as the utility connection fees. All work shall be performed by a properly licensed plumber, general contractor, or underground utility contractor as appropriate. The installation shall be inspected prior to the water service being activated. After connection to OCU services, the responsibility for the maintenance of service lines or wastewater laterals on private property shall remain with the property owner. The county shall have the right to inspect water and reclaimed water service lines, wastewater laterals and backflow preventers on private property as necessary to maintain the integrity of the system. If the plumbing is not maintained in a sanitary and effective operating condition, or if the utility system is harmed, potable water, reclaimed water, and/or wastewater service to the property may be discontinued until the defect is corrected.

Certain elements of the water system are owned and operated by Orange County Utilities including the water and reclaimed water mains and the pipes connecting the main to the meter. OCU also installs and maintains the water and reclaimed water meters. These meters are normally placed in the right of way near the street to ease access.

As an enhancement to the residential cross connection control program, for properties that become subject to the Residential Cross Connection Control Program after January 1, 2018, ownership of the backflow preventer supplied or installed by or on behalf of the property owner shall transfer to OCU after inspection, testing, and acceptance by OCU. For properties served by OCU where a backflow preventer is already installed as of January 1, 2018, the property owner shall retain ownership of the existing backflow preventer. When a residential privately owned backflow preventer requires replacement, or if no backflow

preventer exists and one is required, OCU will install and assume ownership of a new backflow preventer consistent with the placement and configuration established in the OCU Standards and Construction Specifications and this manual.

This change to the residential cross connection control program enables OCU to assume testing and maintenance responsibilities, relieving the homeowner of such obligations. Similarly to water meters, OCU recommends that these backflow preventers are located as closely to the downstream side of the water meter as possible in the right of way. This location provides the highest degree of protection from potential cross connections on private property and also minimizes the need to work on these devices on private property.

All properties served by OCU shall comply with the cross connection control installation, inspection, testing, and maintenance provisions documented in this manual and established in this program. This includes allowing access for Orange County personnel and authorized contractors onsite in order to maintain and comply with the elements of the program. Refusal of access shall be cause for discontinuing potable water service and/or reclaimed water service.

As a condition of service, a customer shall not create or cause a cross connection between the water system (or mains or service lines located on private property) and any other water supply system, wastewater system, or reclaimed water system. A customer shall not create or cause a cross connection between the water system (or mains or service lines located on private property) and any device, appurtenance or material which has the potential to contaminate the water system. All uses of water provided by OCU shall be in accordance with this manual. The presence of a cross connection on a customer's property shall constitute a violation of this requirement and shall be grounds for immediate discontinuance of potable water service and/or reclaimed water service to the customer's premises. Any tampering with or bypassing of a backflow preventer shall be grounds for immediate discontinuance of potable water service and/or reclaimed water service. Service shall not be resumed until conditions at the property have been corrected to the satisfaction of OCU.

Once a backflow preventer is installed, testing must be conducted on a regular frequency to ensure that the device is functioning properly. This testing is required annually for all commercial connections and every two years for residential properties. OCU policy allows for Dual Check devices to be installed in residential areas served by reclaimed water. Since these devices are not testable, they will be replaced at a frequency of no longer than once every 10 years as allowed by state rule and manufacturer's recommendation. More information about proper installation, testing and maintenance of backflow preventers can be found in Section 6

Section 3: Backflow Control

HAZARD CLASSIFICATION

The location and type of backflow preventer assembly to be installed depends on the nature of the hazard involved. In an effort to ensure that proper backflow protection is in place, the Orange County Water Division and Orange County Building Division through onsite inspections of new and existing water services will determine the applicable controls based upon applicable statutory provisions, local plumbing codes, requirements of this manual and the Orange County Utilities Construction Standards and Specifications.

In applying the requirements of this program and to assess the need for and selection of the proper backflow preventer, two degrees of hazards are considered and defined as follows:

High Hazard -Health (contaminant) / toxic: a cross connection or potential cross connection involving any substance that could, if introduced into the potable water supply, cause death, illness, spread disease, or have a high probability of causing such effects.

Low Hazard Non-health (pollutant) / non-toxic: A cross connection or potential cross connection involving any substance that generally would not be a health hazard, but would constitute a nuisance, or be aesthetically objectionable, if introduced into the domestic water supply.

When selecting the type of backflow prevention assembly, the health hazard governs the final choice. Some examples of high and low hazard conditions are as follows:

High Hazard:

- Customer's plumbing systems and/or facilities with on-site substances considered potential contaminants or toxic
- Solar domestic hot water system
- Irrigation systems using potable water
- Any on site auxiliary (not reclaimed water) water system (water supplies or sources not under the control or the direct supervision of the Orange County Utilities Department).
- All potable water commercial services
- Access restrictions to customer's premises which prevent hazard assessment

Low Hazard:

- Residential customers irrigating with reclaimed water
- Residential customers without an irrigation system (no assembly needed)

Types of assemblies to prevent contamination from these hazards include:

1. AG = air gap
2. AVB = atmospheric vacuum breaker*
3. DCVA = double check valve assembly & DCDA = double check detector assembly
4. PVB = pressure vacuum breaker
5. RPBA = reduced pressure principle backflow prevention assembly & RPPDA reduced pressure principle detector assembly. Also commonly known as an RPZ.
6. DuCs = Dual Check Valves (non-testable devices) **

* AVBs may be used to isolate health hazards under certain backsiphonage conditions, under the control of state plumbing codes not related to this policy.

** Dual Check valves are for residential use only in areas irrigating with reclaimed water only.

Hazards are assessed by trained staff prior to allowing connection to the water supply. Some examples of the onsite processes, the hazard level and the appropriate backflow preventer are shown in Table 3-1.

**Table 3-1
Assessment examples of hazards not limited to list below at the water meter or property line.**

Description of Premises	Assessment of Hazard	Recommended Assembly on Water Service Pipe
Hospitals, mortuaries, clinic, laboratories	Health	RPBA
Plants using radioactive material	Health	RPBA
Petroleum processing or storage facilities	Health	RPBA
Premises where inspection is restricted	Health	RPBA
Sewage treatment plant	Health	RPBA
Sewage lift stations	Health	RPBA
Commercial laundry	Health	RPBA
Plating or chemical plants	Health	RPBA
Docks or dockside facilities	Health	RPBA
Food and beverage processing plants	Health	RPBA
Pleasure-boat marina	Health	RPBA
Tall buildings (protection against excessive head of water)	Non-health	RPBA
Steam plants	Non-health	RPBA
Reclaimed water systems	Non-health	DCVA/DuCs
Hydrant meter connection	Health	RPBA
Irrigations systems	Health	RPBA or PVB

NOTE: All commercial connection shall be protected with an RPBA as a minimum.

METHODS OF BACKFLOW CONTROL

Backflow, whether caused by backpressure or backsiphonage, is controlled by eliminating the cross connection and installing an air gap or a backflow prevention assembly (RPBA except as otherwise authorized for specific applications). If it is necessary to maintain an uninterrupted water supply, then installing parallel backflow prevention assemblies shall be required for testing the assembly. An overview of various types of backflow prevention devices and their application is provided below.

Air Gap (AG)

Description (AG) - An approved air gap is an unobstructed vertical distance through free atmosphere between the lowest point of a water supply outlet and the flood level rim of the fixture or assembly into which the outlet discharges. These vertical, physical separations must be at least twice the diameter of the water supply outlet, but never less than 1 in. (25 mm).

Approved Standards (Air-Gap): shall conform to ANSI/ASME standard A112.1.2-1991. Ref. 62-555.360 (6) F.A.C.

In theory, a well-designed and properly maintained air gap is the best means available for protection against backflow. An approved air gap is not always practical and is vulnerable to bypass arrangements, which nullify its effectiveness. In extremely hazardous installations, an approved air gap separation is recommended. In addition, a reduced pressure assembly may be required on the supply line.

Bypasses can easily nullify air gaps. Such an assembly must be constructed in such a way that it is difficult to connect a hose to the supply pipe. Air gaps are included in the testing and inspection program for backflow assemblies to make sure that infractions do not occur. Although an air gap is considered the maximum protection available, it does not guarantee continuous protection because the air gap can be bypassed. The application of an air gap, rather than a reduced pressure principle backflow prevention assembly, depends on the requirements of Orange County Utilities Division and on the assessment of the probability of the air gap being bypassed.

Reduced Pressure Backflow Prevention Assembly (RPBA)

Description (RPBA) - The approved reduced pressure principle backflow prevention assembly consists of two independently acting, approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. These units are located between two tightly closing resilient-seated shutoff valves, as an assembly, and are equipped with properly located resilient-seated test cocks.

Approved Standards (RPBA) - shall conform to AWWA standards C511-92 or ASSE standards 1013 or USC FCCC & HR.

Function (RPBA) - During normal operation, the first internally loaded check valve creates a reduced pressure zone between the two check valves and under flow conditions both check valves open, allowing water to flow to the downstream piping. The relief valve is held closed by the supply pressure acting on a diaphragm within the relief valve. In a no-flow or static-pressure condition both check valves will close and the supply pressure will hold the relief valve shut. The RPBA is effective against backflow caused by backpressure and backsiphonage. The main advantage is that there is visible flow if failure of the assembly or system occurs.

The RPBA is normally used in locations where an approved air gap is impractical. It is important to remember that RPBA's are mechanical assemblies and must be tested and serviced regularly to maintain positive protection. RPBA's are the predominant method of backflow preventer used for most high hazard locations and in all commercial connections.

Double Check Valve Assembly (DCVA) and Double Check Detector Assembly (DCDA)

Description (DCVA) - This approved assembly consists of two internally loaded check valves, either spring-loaded or internally weighted, installed as a unit between two tightly closing resilient-seated shutoff valves as an assembly, and fittings with properly located resilient-seated test cocks.

Approved Standards (DCVA) - shall conform to AWWA standards C510-92 or standards of USC FCCC & HR and ASSE standard 1015.

Approved Standards (DCDA) - Double Check Detector Assembly (DCDA): shall meet ASSE standards 1048 or standards of USC FCCC & HR. A DCDA shall be used on dedicated fire lines, supplying water exclusively for fire protection systems without metering.

Application (DCVA) - The DCVA is effective against backflow caused by backpressure and backsiphonage and is used to protect the water system from pollutants that would not constitute an actual health hazard, but that might be objectionable to the water supply system.

Pressure Vacuum Breaker (PVB)

Description (PVB) - A pressure vacuum breaker assembly consists of an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve, with properly located resilient-seated test cocks and tightly closing resilient-seated shutoff valves attached at each end of the assembly.

Approved Standards (PVB) - shall conform to ASSE standard 1020 or standards of USC FCCC & HR.

Function (PVB). In a normal flow situation the internally loaded check valve remains open and the air inlet valve is closed. When a backsiphonage condition develops, the internally loaded check valve closes. However, if the check valve is fouled, the air inlet valve opens and allows air to enter the PVB thus, breaking the vacuum and not permitting backsiphonage from the downstream piping.

Application (PVB) - The PVB is effective against backflow caused by backsiphonage only and should not be used if backpressure could develop in the downstream piping. The PVB is normally used at irrigation connections to protect against both pollutants and contaminants.

Typical pressure vacuum breaker applications: If used for health hazards, careful consideration must be given to the possibility of the assembly being circumvented. Where such possibilities exist, area or premises isolation is necessary.

Dual Check Backflow Device (DuC):

Description (DuC) - A dual check shall contain two internally loaded, independently operating check valves.

Approved Standards (DuC) - shall conform to ASSE standard 1024

Function (DuC) - In a backpressure condition, the increased in pressure will force the checks to close tighter. If the second check is not working, the first check can act as a backup to stop the backpressure from going through the device. In a Backsiphonage condition, a sub-atmospheric condition is present at the inlet, and the loading of the checks will cause the checks to close. Foreign debris or deterioration of the check can affect both checks simultaneously, rendering the dual check incapable of preventing backflow without an outward indication of failure.

Application (DuC) - Residential service areas with reclaimed water (low hazard). Dual Check valves must be replaced every five to ten years and are installed immediately after the meter box.

Hose Connection Vacuum Breakers:

Hose Connection Vacuum Breakers (HCVB) - shall conform to ASSE standard 1011. Installation enforcement is through Orange County Plumbing Codes and Appendix (E) Section 608.13.6 Florida Building Code-Plumbing.

Thermal Expansion Considerations with Backflow Prevention Devices

When backflow prevention assemblies are installed on a water supply to any premises having water heating units or boilers, a closed internal system may be created. This water system arrangement (closed internal water system) may experience thermal expansion and pressure increases since water expands as it is heated. Since water is not compressible, backflow preventers, and other one-way valves, close a path for expanded water to flow back to the system supply resulting in a system pressure increase.

Thermal expansion of water in a closed plumbing system can create potentially dangerous problems. These include: the buildup of unusually high pressure in a system, pressure surges; and or continuous dripping of a temperature and pressure (T&P) relief valve. Thermal expansion can also lead to a ruptured hot water heating tank and may void the manufacturer's warranty

It is the customer's responsibility to ensure that a thermal expansion valve, tank or a calibrated pressure relief valve at the heating source is installed per local plumbing codes. A temperature and pressure relief valve (T and P valve) on the water heating unit or boiler is also required by the local plumbing codes.

Section 4: Backflow Prevention Requirements

BACKFLOW PROTECTION LOCATIONS:

Backflow Protection Locations Installations: Ref. DEP rule 62-555.360

The Orange County Utilities Development Engineering Division reviews new site plans and evaluates the hazards inherent in supplying a customer's water system, that is, to determine whether solid, liquid, or gaseous pollutants or contaminants are or may be handled on the consumer's premises in such a manner as to possibly permit pollution or contamination of the potable water system.

The type and location of assembly to be installed depends on the nature of the hazard involved. In an effort to ensure backflow protection is in place, Orange County Utilities Water Division, through on-site inspections of new and existing water services, enforces state and local rules, these policies, county ordinances, and engineering plans.

If there is a change in water use on the premises that would affect the type of hazard to the public water system, the customer shall inform the Orange County Utilities Water Division. The customer's backflow prevention assembly shall be matched to the appropriate hazard to provide appropriate protection for the public water system.

Backflow preventers shall be installed at the service connection on the discharge side of the potable water meter. The owner of the backflow preventer is responsible to test and maintain the backflow assembly in good working order. Failure to test backflow prevention devices as required or maintain it in good working order shall be grounds for service termination as stated in Orange County Ordinance No. 2017-16. Failure to install a required backflow preventer shall be grounds for service termination.

An approved backflow prevention assembly shall be required on any direct interconnection between the public potable water supply and any other approved potable water supply of a different type such as an interconnection to another provider through an interconnection. Subject to approval of the Director or his designee, backflow prevention assemblies may be eliminated for interconnections with other public utilities who demonstrate that a compliant cross connection control program is in place.

All backflow preventers in contact or that could be in contact with Orange County's drinking water system must be lead free in accordance with Safe Drinking Water Act.

In areas served by a Reclaimed Water service, cross connections between the customer's potable water system and the customer's reclaimed water system are prohibited in accordance with Chapter 62-555.360 F.A.C. The use of reclaimed water shall conform to Orange County Utilities Reclaimed Water Ordinance 94-21 and Chapter 62-610 of the F.A.C.

For properties with auxiliary water supplies including a well with a pump used for irrigation, the well should be permitted and installed as follows:

- Surrounded by an area which can be kept in a sanitary condition.
- Adequate in size, design and development to obtain as much of the desired yield as the aquifer may be capable of furnishing and constructed in such a manner as to maintain existing natural protection against pollution and to exclude pollutants from known sources.
- The pumping equipment shall be installed so that the pump and its surroundings can be kept in a sanitary condition, have a capacity consistent with the water needs, be durable and reliable in character, be constructed of material which will not create a toxic condition in the water and provide reasonable protection against entrance of pollution.
- For all properties provided potable water service by OCU, the well owner shall be required to install a backflow preventer assembly at the potable water meter to protect the potable water system in case of a cross connection in accordance with the Cross Connection Control Program.

FDEP rules include some special assessment categories and require protection with a backflow preventer for auxiliary water, reclaimed water systems, fire protection systems, irrigation systems, residential water services and solar domestic hot water systems shall be backflow protected as stated in the tables below:

Table 4-1 Requirements for Auxiliary or Reclaimed Water Systems:

<i>Type of auxiliary or reclaimed water system at premises</i>	Commercial Type of backflow assembly	Residential Type of backflow assembly	*Additional protection measure. Premises Inspections
Auxiliary water system that is used for irrigation	Reduced Pressure Principle Assembly (RPBA-Standard ASSE 1013)	Reduced Pressure Principle Assembly (RPBA-Standard ASSE 1013)	
Auxiliary water system that is used for purposes other than irrigation	Reduced Pressure Principle Assembly (RPBA-Standard ASSE 1013)	Reduced Pressure Principle Assembly (RPBA-Standard ASSE 1013)	
Reclaimed water system	Reduced Pressure Principle Assembly (RPBA-Standard ASSE 1013)	Double Check Valve Assembly ASSE 1015 AWWA, C510-92 Lead Free Dual Check Valve ASSE 1024** If cross connection is found upgrade to RPBA	At time of installation and every four (4) years thereafter, hydraulic inspection between potable & reclaimed water and customer education is required.
Undeveloped properties with auxiliary water, no OCU service	No backflow assembly needed or required	No backflow assembly needed or required	

** Starting 1/1/18 the Lead Free Dual Check Valve ASSE 1024 is the required device for Residential Reclaimed systems.

Table 4-2 Requirements for Fire Protection Systems:

These devices are required at **any connection of the potable water systems to commercial, industrial or residential fire system served by the Orange County Utilities water system via dedicated fire service connection.**

These dedicated fire connections shall have a metered account established with Orange County Utilities.

Type of fire protection system	Type of backflow assembly
Dedicated fire protection system that has provisions for introducing chemicals or antifreeze	ASSE -1047 and (FM) approval, Reduced Pressure Detector Check Assembly, (dedicated fire systems).
New service connection, wet pipe dedicated fire sprinkler system or wet standpipe system that has no provisions for introducing chemicals or antifreeze	ASSE -1048 and (FM) approval Double Check Detector Check Assembly, (dedicated fire systems).
Existing dedicated service connection, wet pipe fire sprinkler system or wet standpipe system that has no provisions for introducing chemicals or antifreeze	ASSE -1048 and (FM) approval Double Check Detector Check Assembly, (dedicated fire systems).
Existing service connection, with internal alarm check, closed wet pipe fire sprinkler system or wet standpipe system that has no provisions for introducing chemicals or antifreeze	No backflow assembly, relying State fire codes
Internal backflow assembly, where the fire protection system connects to the customer's potable water system	No backflow assembly, relying Florida State fire codes or Florida Building codes Orange County Utilities, not required to ensure annual tests, repair or replacement

Table 4-3: Requirements based on Hazard for Commercial and Industrial Connections

Type of Water Service	Backflow Assembly	Hazard
All Commercial/Industrial	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High
Toxic chemical used on site:	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High
Non-toxic chemicals used on site	Double Check Valve Assembly ASSE 1015 AWWA, C510-92	Low
Irrigation-Potable	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High
Master Meter Connections	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High & Low
Commercial/industrial or residential fire suppression systems with chemical additives or additional auxiliary water supply including on site fire hydrants	& (FM) approval, Reduced Pressure Detector Check Assembly, (chemical use protection from antifreeze, corrosion inhibitors) on dedicated fire systems, ASSE 1047	High
Commercial/industrial or residential fire suppression systems without chemical additives	& (FM) approval Double Check Detector Check Assembly, dedicated fire systems, ASSE 1048	Low
Hydrant or temporary construction	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High
Properties maintaining auxiliary water supply (wells, other auxiliary water)	Reduced Pressure Principle Backflow ASSE -1013 AWWA, C511-92	High
Reclaimed water (residential)	Double Check Valve Assembly ASSE 1015 AWWA, C510-92 Lead Free Dual Check Valve ASSE 1024	Low

Section 5: Ownership of Backflow Preventers

Table 5-1: Person(s) Responsible for Ownership, Installation, Testing and Maintenance and Repair of Backflow Assemblies: At the water metered or service connection.

Customer Classification	Backflow Assembly Installation / Initial Testing	Ongoing Backflow Assembly Testing	Backflow Assembly Maintenance, Repair & Replacement
Commercial or industrial accounts and residential fire-lines	Customer	Customer	Customer
Residential Customers - (dedicated irrigation, potable water with reclaimed irrigation, potable water with other on-site hazard)	OCU – For existing customers required to have a backflow prevention device subject to the residential cross connection control program as of January 1, 2018	OCU	OCU
	Customer – New customers or new hazards created after January 1, 2018	OCU	OCU (subject to initial acceptance for devices installed after January 1, 2018)

BACKFLOW PREVENTER MAINTENANCE

- Effective January 1, 2018 - Orange County Utilities is responsible for testing, repair and replacing residential backflow preventers subject to initial acceptance of the installation for those devices installed after the effective date.
- Orange County Utilities is not responsible for piping to and from the backflow preventer. Orange County Utilities is responsible for maintaining the backflow preventer and fittings that are connected to it between the unions located immediately on each side of the backflow preventer. Please see figures 6-1 through 6-5.
- All pipe maintenance, after the water meter, is the sole responsibility of the property owner.
- Testing, repair, maintenance, and replacement of backflow preventers on commercial accounts, industrial accounts and residential fire lines are the sole responsibility of the property owner.

Section 6 Installation, Testing and Maintenance:

INSTALLATION:

All backflow assemblies shall be installed and placed on the discharge side of the potable water meter connection. In instances where a residential backflow preventer cannot be installed on the discharge side of the water meter, due to space restrictions, it shall be installed no more than 18 inches beyond the side walk or property line unless authorized by the OCU Director or his designee. Any Pressure Vacuum Breakers (PVB) may be installed next to the house and must be accessible at all times and should not be placed behind gates or other structures that could block access to the device. The standard type of assembly is based on degree of hazard (high or low). All backflow assemblies installed at connections to the OCU water system shall meet at least one of these standards: Foundation for Cross-Connection Control and Hydraulic Research (FCCC&HR) of SC, or American Society of Sanitary Engineering (ASSE) and or American Water Works Association (AWWA). All backflow preventers installed on residential services after January 1, 2018 shall be manufactured by Watts, Wilkens or Apollo. Dual Check devices installed for residential properties with reclaimed water service may be manufacturer whose product conforms to ASSE 1024 and is lead free.

Table 6-1: Requirements and Applicable Standards for Installation of Backflow Devices at Service Connections

Standard	Backflow Preventer	Hazard Type
AWWA, C510-92	Double Check Valve Assembly	Low
ASSE -1015	Double Check Valve Assembly	Low
AWWA, C511-92	Reduced Pressure Principle Backflow Assembly	High
ASSE -1013	Reduced Pressure Principle Backflow Assembly	High
ASSE -1020	Pressure Vacuum Breaker, irrigation	High, without back-pressure (side, next to house)
ASSE -1047	Reduced Pressure Detector Check Assembly, chemical, dedicated fire systems	High
ASSE -1048	Double Check Detector Check Assembly, dedicated fire systems	Low
ASSE -1011	Hose Bib Vacuum Breakers,	Low- general use
ASSE-1024	Dual Check Valve Assembly	Low – Residential Reclaim as the Only Hazard

NOTE: All commercial connections and residential fire lines shall use at a minimum an RPBA ASSE 1013.

The limits of OCU ownership for residential backflow preventers includes the backflow preventer and fittings that are connected to it between the unions located immediately on each side of the backflow preventer.

Installation (RPBA) -The following are design installation specifications. For installation details refer to the manufacturer’s recommendations. The RPBA shall be installed with adequate space to facilitate maintenance and testing at the water meter connection or property if a meter is not used. Adequate clearance from the ground level must be provided (minimum 12 inches) to facilitate the removal of the relief valve and/or check valves. Refer to the manufacturer’s literature for temperature ranges. An RPBA must be protected from freezing temperatures and if installed where temperatures will reach 110 °F (43°C) or above. Consult manufacturer’s specifications for recommendations. An RPBA shall not be installed in a pit below ground level..

The RPBA shall not be installed in an area where corrosive fumes or gases could render the assembly inoperable. The RPBA shall be installed “in line” and should be the same size as the supply and discharge piping; assembly shall be supported to prevent sagging if necessary. Where test cocks are threaded, these test cocks shall be not used for any other purpose except testing, as is the intent of the manufacturer.

Requirements specific to residential single family devices subject to the residential cross connection control program - All newly installed backflow preventers on residential services after January 1, 2018 shall be manufactured by Watts, Wilkens or Apollo. The limits of OCU ownership of new RPBAs shall be from the union connecting the inlet and outlet of the Backflow preventer to the connecting pipe.

Limits of OCU ownership for residential connections

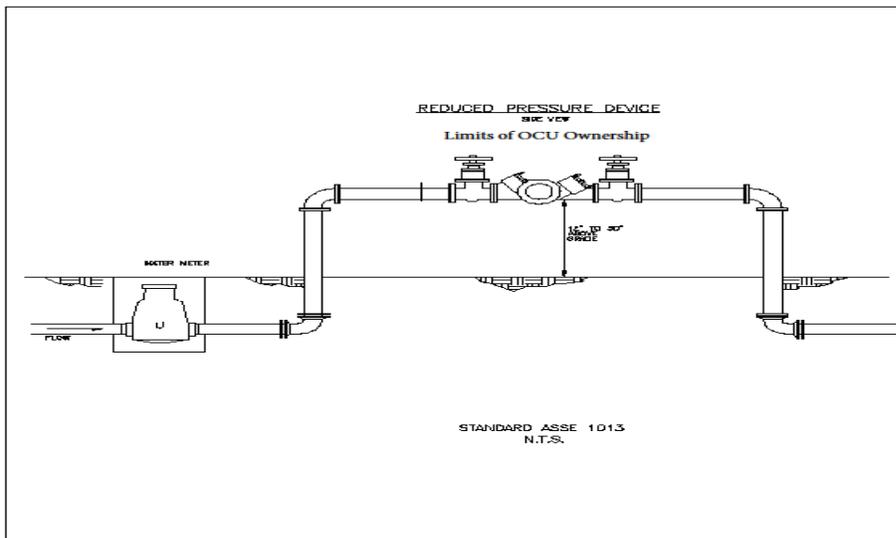


Figure 6-1 Reduced Pressure Backflow Assembly (RPBA)

NOTE: For all commercial properties the backflow preventer is owned by the property owner.

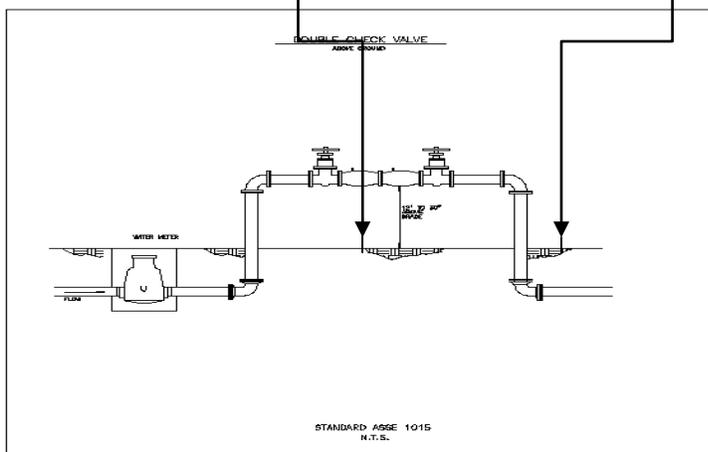
Installation (DCVA) - The following are design installation specifications. For installation details refer to the manufacturer's recommendations. The DCVA should be installed with adequate space to facilitate maintenance and testing at the water meter connection or property line if a meter is not used. A DCVA shall be installed (12 inches above ground level) unless approved otherwise by Orange County Utilities with adequate drainage to maintain a dry location.

A strainer may be required ahead of the assembly. A strainer is not considered to be part of an approved backflow prevention assembly. Therefore, if one is required, due to local conditions, the additional head loss must be taken into account. No strainer is to be used in a fire line without the approval of the insurance underwriters. It is important to note that where strainers are required they require frequent cleaning and inspection to ensure against fouling and deterioration of the mesh. Where the test cocks are threaded, these test cocks shall be not used for any other purpose except for testing, as is the intent of the manufacturer. Device shall be supported to prevent sagging if necessary.

Thoroughly flush the lines before installing a DCVA, DCVAs shall be installed in a horizontal position unless otherwise recommended by the manufacturer. Before installation, refer to the manufacturer's literature for temperature ranges. A DCVA must be protected from freezing temperatures. For temperatures of 110°F (43°C) or above, consult manufacturer's literature for recommendations. The DCVA shall be installed "in line" and should be the same size as the supply and discharge piping.

All newly installed backflow preventers on residential services after January 1, 2018 shall be manufactured by Watts, Wilkens or Apollo.

Figure 6-2 Limits of OCU ownership for residential connections

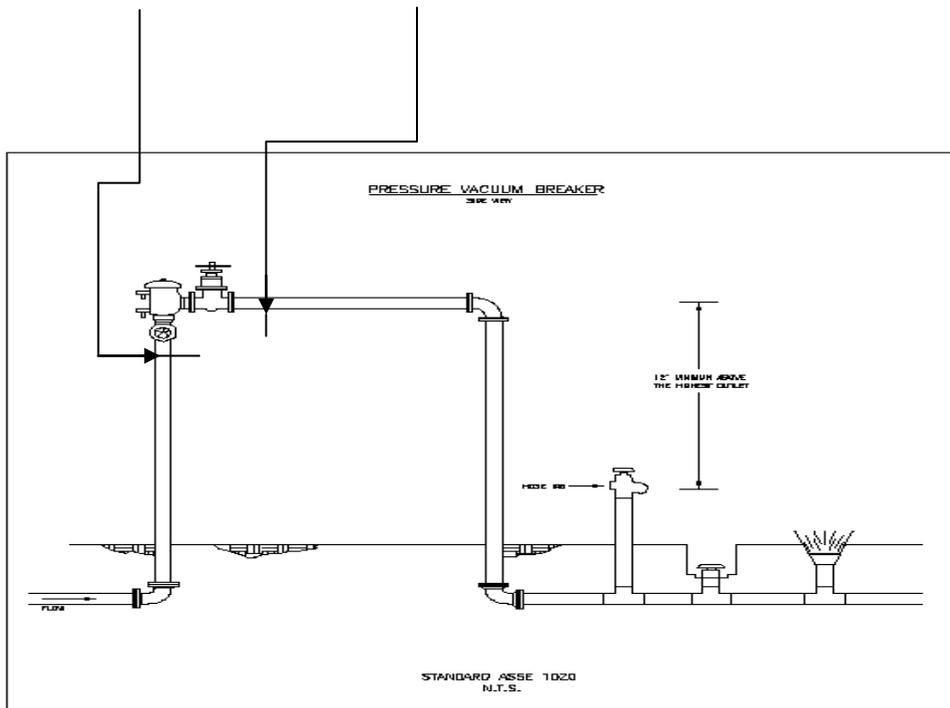


Installation (PVB) - The following are design installation specifications. For installation details refer to the manufacturer's specifications. The PVB shall be installed at least 12 in. (305 mm) above highest water outlet/irrigation sprinkler head. The PVB shall be installed in a vertical position with adequate space to facilitate maintenance and testing. The PVB shall be installed in an area where water spillage through the vacuum relief valve (air vent) is not objectionable. The PVB shall not be installed in a vent hood or where toxic or objectionable fumes could enter and contaminate the potable water piping. The PVB shall be installed "in line" and should be the same size as the supply and discharge piping. Low inlet-supply pressure will make closing of the air inlet port very difficult. Additionally, water hammer often occurs when the air inlet valve closes. Before installation, refer to the manufacturer's literature for temperature ranges. The PVB must be protected from freezing temperatures. If installed where temperatures will reach 110° F (43° C) or above, the hot-water type of assembly must be used. Where test cocks are threaded, these test cocks shall be not be used for any other purpose except for testing, as is the intent of the manufacturer. Device shall be supported to prevent sagging.

All newly installed backflow preventers on residential services after January 1, 2018 shall be manufactured by Watts, Wilkens or Apollo.

Pressure Vacuum Breaker (PVB) Figure 6-3

Limits of OCU ownership for residential connections



Installation (Dual Check Backflow Device):

A dual check shall contain two internally loaded, independently operating check valves.

Approved Standards (DuC): shall conform to ASSE standard 1024. All manufacturers will be allowed for Dual Check devices as long as the installed device is inspected and meets ASSE 1024 and is Lead free.

Function (DuC). In a backpressure condition, the increased in pressure will force the checks to close tighter. If the second check is not working, the first check can act as a backup to stop the backpressure from going through the device. In a Backsiphonage condition, a sub atmospheric condition is present at the inlet, and the loading of the checks will cause the checks to close. Foreign debris or deterioration of the check can affect both checks simultaneously, rendering the dual check incapable of preventing backflow without an outward indication of failure.

Application (DuC) - Residential service areas with reclaimed water (low hazard). Dual Check valves must be replaced every five to ten years and are installed immediately after the meter box.

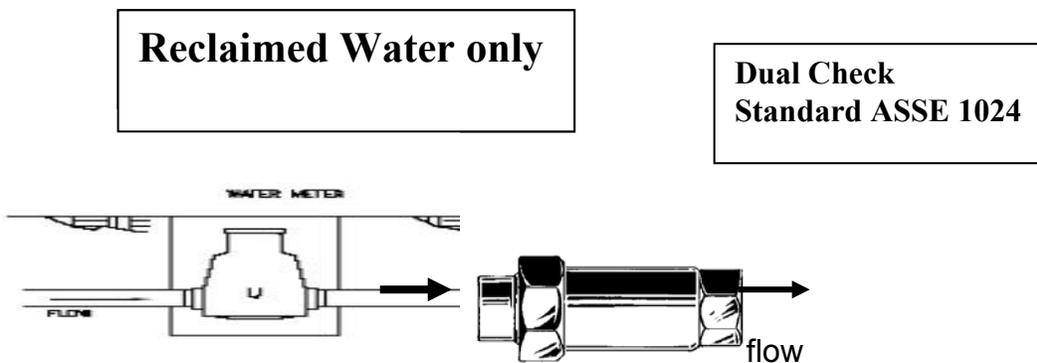


Figure 6-4 Dual Check Device

OCU ownership of the dual check device is limited to the piping from the last union prior to the device and the first union after the device.

Hose Connection Vacuum Breaker (HCVB):

When used by the homeowner, the hose Connection Vacuum Breakers (HCVB): shall conform to ASSE standard 1011. Installation enforcement is through Orange County Plumbing Codes and Appendix (D) Section 608.13.6 Florida Building Code-Plumbing

OCU assumes no ownership of these devices.

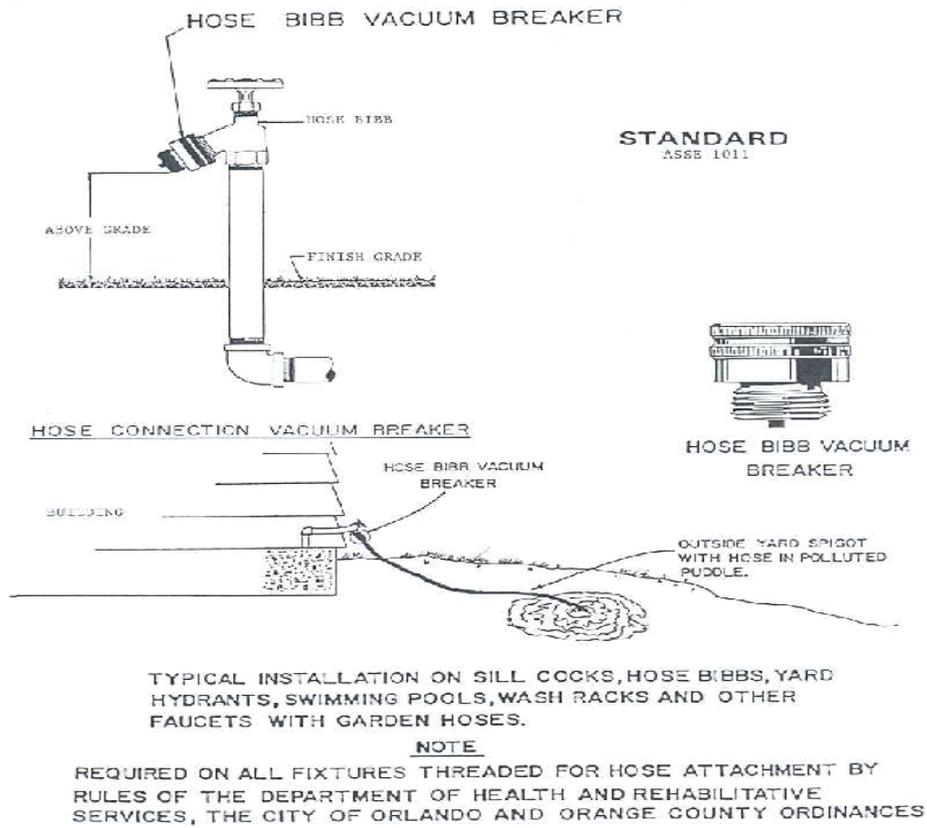


Figure 6-5

INSPECTIONS:

After a water service has been installed and inspected according to the Orange County Building permit requirements, the water service connection will be inspected by Orange County Utilities authorized personnel as part of a 10-year risk assessment or during testing and/or replacement of the backflow prevention device, whichever is sooner. This inspection shall ensure that activities on the property are consistent with the account type and that no hazards to the water system exist on the property. The location and type of backflow preventer will be documented at this inspection

Backflow preventers attached to the water system shall be tested and maintained in accordance with this program. For commercial properties, testing, maintenance, repair and replacement of backflow preventers and reporting of backflow preventer status and test results shall be performed by the owner of the device or assembly. This includes commercial properties, homeowner's associations and other connections to the system.

OCU will take over inspection, testing, maintenance and repair or replacement for single meter residential properties with connections to OCU water service beginning January 1, 2018.

For all **Commercial/Industrial Services** the backflow preventer must be tested at time of installation and annually thereafter. Also, Backflow preventers must be tested after repair, relocation or replacement.

Residential: The backflow preventer must be tested at time of installation and every two years thereafter. Also, Backflow preventers must be tested after repair, relocation or replacement.

All Dual Check backflow preventers must be replaced every ten years as they are not testable. Existing double check valve assemblies in residential reclaimed areas will be replaced on the same cycle as dual checks as OCU is converting to dual check valve assemblies for all connections within this hazard class.

The county shall have the right to access the premises at any reasonable time for the purpose of inspection, testing, repair or replaced the backflow preventer and for conducting risk assessment. Also, the county or its representative should have access to the property to conduct cross connection inspections. A customer's refusal or failure to allow access should be grounds to discontinue service.

If there is an existing cross connection, a Reduced Pressure Principal Backflow Assembly (RPBA) shall be installed or the service must be discontinued until the cross connection is eliminated.

Inspections in Reclaimed Areas - The customer's potable water system, reclaimed water system and backflow preventer shall be open for inspection at all reasonable times to authorized representatives of Orange County Building Division or Orange County Utilities Department. The inspection will verify no cross connections exist between the potable water and the reclaimed systems or any other auxiliary water system. Inspections shall be

performed in compliance with (FDEP rule: 62-610.469) and the Orange County Reclaimed Water Ordinance (Ord No. 94-21-sec: 37-662) when the customer first connects to the reclaimed water distribution system and periodic inspections shall be performed as an important part of the program.

Restricted, Classified, or Other Closed Facilities- an approved backflow prevention assembly shall be installed on the service connection to any facility or premises that are not readily accessible for inspection by the water purveyor or its representative because of military secrecy requirements or other prohibitions or restrictions. A reduced pressure principle backflow prevention assembly is required.

TESTING AND TESTER REQUIREMENTS:

Testing:

Testing of backflow preventers is required annually for all commercial connections to the water system. The testing is the responsibility of the property owner and the results of testing shall be reported to OCU Cross Connection Control section on the required forms at the completion of the testing. Testing must be done by a person or persons certified in accordance with state standards and the tester's credentials must be approved by the Orange County Building department. Failure to provide these results can result in discontinuance of water service. Any backflow preventer that fails the testing shall be repaired or replaced and retested. If it is replaced the type, make, model and location of the backflow preventer will be reported to OCU Cross Connection Control Section. The results of testing shall be reported on the Backflow Preventer Field Test Report (Appendix A).

Testing of backflow preventers under the residential cross connection control program will fall to OCU once the initial installation and testing has been completed by the property owner. These devices will be tested once every two years. Testing must be done by a person or persons certified in accordance with state standards and the tester's credentials must be approved by the Orange County Building department. If a device fails testing it will be repaired and retested or replaced and tested. All results of testing will be reported to OCU and remain on file for no less than 10 years,

Tester Requirements:

All persons engaged in testing backflow preventers and reporting the data to Orange County Utilities under this program shall be certified backflow testers.

Certified Backflow Tester: A person who is registered with the Orange County Division of Building Safety as a Backflow Tester and or who also is certified through a training facility as being competent to test and certify the operation, and make reports on backflow prevention assemblies. The tester must also use gauges that have been calibrated annually. A Backflow Tester making tests on backflow assemblies on dedicated fire lines shall also be certified by the Division of State Fire Marshal uniform fire safety rules and standards or qualifications under a fire sprinkler contractor. The professional requirements for the backflow prevention testers are documented in ASSE standard 5110,

Any person testing, installing or repairing a backflow prevention assembly in Orange County must be a state licensed plumbing contractor and be registered with Orange County Building Division. Any person testing or repairing a backflow assembly on a fire protection system, in Orange County, must be a state licensed fire sprinkler contractor and be register with Orange County Building Division.

Registering with Orange County:

Registration is at ORANGE COUNTY DIVISION OF BUILDING SAFETY
201 South Rosalind Ave, Orlando, Florida 32801, 1st floor, Contractors Licensing
Department, Licensing questions contact: Phone 407-836-5522; fax 407-836-5502
Items to take with you include:

- Business license with testers name, address, phone number, fax number.
- Current non-expired backflow tester training school certificate,
- Current non-expired gauge calibration certificate
- Annual licensing payment,
- Signed voluntary code of conduct form.

Inactive means the Backflow Tester is missing on file: annual gauge calibration certificate, or training school certificate or both.

Expired means that the Backflow Tester is missing on file: annual recording fee, expires September 30 of each year.

Orange County Utilities Water Division will not place a Backflow Tester's name on our contractors listing unless the ORANGE COUNTY DIVISION OF BUILDING SAFETY registers the tester.

Orange County Utilities Water Division is tracking backflow assemblies for containment only (at the water meter or property line); residential irrigation may be on side of building. No internal plumbing backflow assemblies test reports shall be sent or faxed to Orange County Utilities Water Division.

All registered Backflow Testers are viewable on the County web site. Under Service Section Find a Local backflow tester use option 3, Search by License type (Back Flow Tester) at:

<https://fasttrack.ocfl.net/OnlineServices/>

TEST RESULTS

Only a certified backflow tester shall perform in-line field testing operational tests of backflow prevention assemblies. The certified backflow tester shall send an email of the certified test results including information of repairs or replacement of the BFA to Orange County Utilities. Failure to provide water supplier with the certified records, or improper testing or the falsification of certified records, shall be cause for revocation of the certified backflow tester's Orange County registration by the Building Division. A failed test requires

immediate repair or replacement of such failed backflow prevention assembly. Upon repair or replacement of such failed backflow prevention assembly, the water service customer (commercial service) has the responsibility to have the repaired backflow prevention assembly or its replacement tested by a certified backflow tester. If Orange County Utilities does not receive the backflow test report as required, then Orange County Utilities is authorized to test, repair and/ or replaced the backflow prevention assembly. The cost to test, repair and/ or replaced the backflow prevention assembly shall be the responsibility of the water service customer.

Failure to provide water supplier with the certified records, or improper testing or the falsification of certified records, shall be cause for revocation of the certified backflow tester's Orange County registration by the Building Division

Backflow assembly test results for Orange County water service area must be e-mail to water.backflow@ocfl.net or faxed to: 407 836-6830.

TESTING STANDARDS, IN-LINE FIELD TESTING:

The method of testing shall comply with standards of the Foundation for Cross-Connection Control and Hydraulic Research (FCCC&HR) and or American Society of Sanitary Engineering (ASSE) approved Testers training.

The method of testing shall conform to the following ASSE standards:

RPBA ASSE 5013

DCVA and Double check Fire Protection Assemblies ASSE 5015

PVB ASSE 5020

Testing Equipment:

Backflow test equipment can be Mid-West Instrument differential models and or differential models listed by FCCC & HR-USC of acceptable gauges, sight tube method, Duke digital, or test equipment sold by backflow assembly manufactures, and an annual test gauge calibration.

Testing procedures (guidelines only):

The tester should notify the customer before the test begins.

Notify the customer if you are shutting down any water service.

Notify the fire department if you are shutting down a fire service.

A state licensed fire sprinkler contractor shall test Backflow prevention assemblies on dedicated fire lines.

Flush residual dirt through the test cocks before attaching test gauges.

When testing a backflow prevention assembly, ensure the high-and-low pressure bypass hoses of the test kit are connected to the proper test cocks; to avoid damage to the test gauges, open test cocks slowly when bleeding air through the bypass hoses.

The test kit gauges shall be calibrated once per year as required by Orange County Utilities and the Orange County Building Division backflow registration requirements.

Repair:

Any backflow preventer failing a test will be repaired and retested within 30 days of failing the test.

Replacement:

A backflow preventer that cannot be repaired and documented as having successfully passed the testing requirements shall be replaced with a new device and that device will be tested. All information regarding the make, model, location on the property and the test results shall be reported to OCU Cross Connection Control section and documented on the Backflow Preventer Field Test Report (Appendix A).

Starting January 1, 2018 OCU will be converting from DCVAs to Dual Checks for the reclaimed water services. All currently installed DCVAs on reclaimed water systems shall be replaced by OCU with a Dual Check device. This process may take place over a 10 year period. OCU is targeting an initial replacement cycle of 8 years for dual check devices and double check valve assemblies in residential reclaimed areas. No testing is required for Dual Check or double check valve assembly devices in residential reclaimed areas that are on a replacement cycle not to exceed 10 years.

Section 7: New and Existing Service Connections

PROCEDURES FOR ASSESSING AND INSPECTING NEW AND EXISTING SERVICE CONNECTIONS

New Water Service Connections: Ref-DEP rule 62-555.360

To comply with state regulations, effective 1/1/2015, all new water services shall be assessed for the need of backflow protection prior to water activation. Each metered water service work order will be reviewed in the field or by a customer connection questionnaire prior to providing water service. (A questionnaire may be used at time of sign up for water service with Orange County Utilities Customer Service).

In areas with reclaimed water irrigation system, an Initial Cross Connection Inspection is required prior to water activation. Customer/contractor should request a cross connection inspection via email using information provided by Orange County Utilities Customer Service. The request for inspection should be made, by the customer, once the irrigation system is install and prior to removing the lock from the reclaimed water meter. Only, Orange County Utilities can remove the lock from reclaimed water meter.

Commercial or Industrial:

On any new commercial or industrial construction plans, Orange County Utilities Engineering shall review projects and call out backflow protection at the water service connection. At each water service connection to any commercial or industrial customer, the type of backflow assembly is based on the water use type of hazard. Orange County considers commercial and industrial water meter connections to be high hazard, therefore, at minimum, a Reduced Pressure Principle Backflow Assembly, RPBA-ASSE 1013 shall be installed.

Existing water service connections

All existing water service connections will receive an initial risk assessment survey by Orange County Utilities or its representative by December 31, 2017. The risk assessment indicates the type of hazard and protection needed at the service connection. Each existing connection will be assessed once every ten years thereafter unless a Reduced Pressure Principle Backflow Assembly (RPBA) is installed at the service connection. RPBA's are will be tested every two years, therefore, the follow-up assessment will be part of the testing process. (A questionnaire may be used at time of sign up for water service and the ten year re-assessment). Assessments made before the effective date 12/31/17 may be used to satisfy the requirements.

Section 8: Record Keeping

Orange County Utilities shall keep records and all documentation related to backflow prevention for a period of 10 years in accordance with FDEP rules Ref-DEP rule 62-555.360 and 62-550.720(3). To include copies of any written reports, summaries, backflow assembly installation request notices and annual testing notices or communications related to cross connection control program or surveys conducted. Such records of any on site surveys for potential cross connection hazards or backflow assembly installation and annual testing will also be electronically saved.

Orange County Utilities shall keep the latest assessment questionnaire or risk assessment survey record of each service connection until the next assessment is made. These assessment questionnaire or risk assessment survey record may be paper and or electronic format. Orange County Utilities will maintain up to date computer inventory of backflow assemblies or devices at water service connections.

All annual cross-connection program activities reports are due within three months after the end of calendar year using Form 62-555.900 and backflow incident reports shall submitted by phone to DEP as soon as possible but never later than noon the next business day after the backflow incident. Also a written incident report shall be submitted to the local DEP office within one month of the incident.

Backflow tests, repairs, overhauls, replacements and incident reports shall be kept on file for at least ten years. Ref DEP 62-550.720 (3). These records shall include backflow assemblies at or within the water treatment source facilities, storage or distribution facilities. Non-testable dual check backflow device standard (ASSE 1024) used at the water service connection shall be replaced at least once every ten years and records shall be saved for at least ten years.

The inventory listing shall include at a minimum:

Customer's name

Service and mailing address

Backflow assembly location

Backflow assembly type, size, model, manufacturer, serial number, installation or identified date

Backflow assembly tests for at least ten years

Backflow Tester name

Backflow assembly test results

Section 9: Customer and Public Education

Orange County Utilities will conduct at least one cross connection control educational activity each year. Customer educational activities may include one of five means:

- Brief description of the utilities cross connection control program in the consumer confidence report. Ref rule 62-550.824
- Distributing an educational brochure about cross connection control and backflow prevention to all customers
- Maintaining a display about cross connection control and backflow prevention at a local mall, or show for at least one week
- Public service announcement about cross connection control and backflow prevention aired on a local radio or television station
- Article about cross connection control and backflow prevention published in a local newspaper of general circulation

Educational Materials

Orange County Utilities shall provide basic education materials on cross connections and backflow hazards. Such materials could include: mailing inserts, text within install or test notices and the existing web site at, <http://www.ocfl.net/CrossConnection> .

Section 10: Investigating and Responding to Backflow Incidents

PROCEDURES FOR INVESTIGATING AND RESPONDING TO BACKFLOW INCIDENTS

Ref-DEP rule 62-555.360

Any person knowing or suspecting a cross connection incident shall immediately notify Orange County Utilities Water Division CCC Program Coordinator (designee) to start the incident response procedures. The contact phone numbers are during normal working hours are (407) 836-6970, or after hours dispatch (407) 836-2777.

In the event that Orange County Utilities is informed of or suspects a potential cross connection to the potable water system, the following procedures shall be followed To minimize water supply contamination due to a cross-connection and/or backflow incident event.

When Orange County Utilities Cross Connection Control section is first notified of a backflow incident or event, the CCC Program Coordinator (designee) shall be contacted to direct the investigation and corrective action and is authorized to utilize all utility resources (employees or materials) to take immediate steps deemed necessary to correct the hazardous condition; which shall include temporarily installing a backflow assembly at the water meter connection until the backflow hazard has been eliminated or discontinue water service to premises where a hazardous condition exists.

If the water service is temporarily locked off, the CCC Program Coordinator (designee) shall notify Utilities Customer Service (407-254-9750). If the backflow incident or event is deemed to be a health hazard that has, will or could degrade the public water system, the water service shall be temporarily terminated. All efforts shall be made to notify the customer in advance of this termination.

If the customer is unaware of the cross connection incident or is not at the site, the Water Division will leave a door hanger explaining the incident and include the name and phone number of a Water Department contact person.

The customer will be notified in person, by phone or door notice of what has to be done by the utility to temporarily correct the problem and what is needed by the customer. Most cross connections occur on the customer's/consumer's private plumbing system. The CCC Program Coordinator (designee) shall notify the local plumbing officials as necessary for violations or corrective action including the Chief plumbing inspector (designee). The Utilities Water Quality Manager and Water Distribution Manager will also be notified.

The local plumbing officials may require chlorination of the internal plumbing system past the water meter connection and bacteriological samples at the expense of the property owner or person/firm that created the cross-connection.

If the outage involves a fire service and/or fire hydrant the Fire Department will be notified before any action is taken.

If deemed necessary, the Orange County Utilities staff may take water samples at the site as well as the surrounding area. If the source of the backflow contamination is located, the area should be isolated. Only one feed will be open and the contaminated area will be flushed by distribution personnel using Unidirectional Flushing techniques (UDF). Flushing of water mains will continue until contamination is removed and water system is restored to a potable state. After the affected area has been flushed samples will again be taken.

Documentation of all backflow incidents will be maintained by CCC Program Coordinator (designee).

Additional Incident Procedures:

Water Distribution employees will isolate the water distribution system by closing service connection valves to prevent the spread of contamination to the water distribution system or buildings in the incident area. The CCC Program Coordinator (designee) or dispatch may notify the Water Quality Manager to determine the type of sampling needed in the affected area.

Distribution or Water Quality personnel may take bacteriological and chlorine residual samples at the incident site and surrounding area to determine spread of contamination and to determine chlorine residuals.

The Water Quality Manager and Distribution Section Manager will discuss the incident and investigation with the Division Manager to make proper reporting to the local FDEP as required.

Backflow incident reports as described in Section 8 shall be submitted by phone as soon as possible but never later than noon the next business day after the backflow incident. Also a written incident report shall be submitted to the FDEP central district office within one month of the incident. Backflow incident reports shall be kept on file for at least ten years. Ref DEP 62-550.720

The cross connection or backflow incident report shall contain at a minimum: (see Appendix C)

- Date and time of discovery
- Source and cause or suspected source and cause
- Type and concentration of contaminants or foreign substances found within the distribution system or the customer's potable water system as a result of the incident and the portion or estimate portion of the public distribution system affected
- Precautionary or corrective actions taken in response to the incident and the date and approximate time to complete each action
- Extent known by the public water system, the number and type of illnesses or physical problems reportedly resulting from the backflow incident

Section 11: Other Guidelines

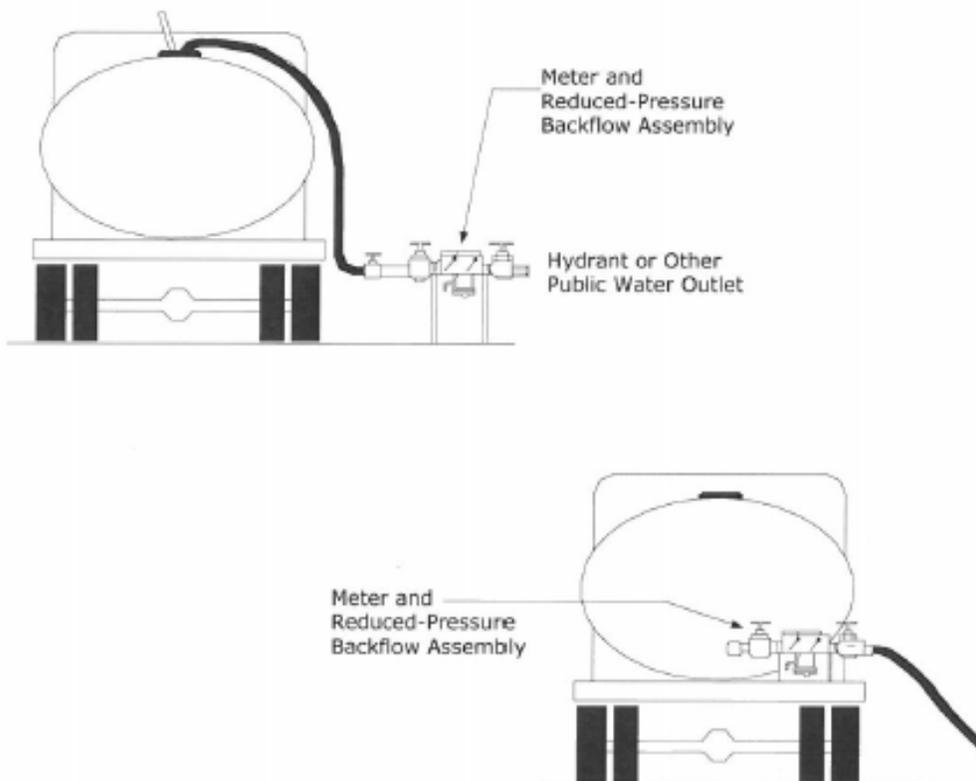
WATER HAULING EQUIPMENT

An approved backflow prevention assembly shall be installed on any portable spraying or cleaning units that have the capability of connecting to any potable water supply that does not contain a built-in approved air gap. The hazards normally found in water-hauling equipment include cross connections between the potable water system and:

- Contaminated tanks with toxic chemical compounds used in spraying fertilizers, herbicides, and pesticides
- Water-hauling tanker trucks used in dust control
- Other tanks on cleaning equipment

Protection recommended: A reduced pressure principle backflow prevention assembly is recommended as shown in Figure 10-3. There may be times when the inspection and maintenance of RPBAs on portable units are questionable. Under such circumstances, the water supplier may designate specific watering points, such as those equipped with air gaps, for filling portable units.

Figure 11-1 Approved methods of filling water-hauling equipment.



RECOMMENDATIONS FOR FIRE SYSTEMS:

Class 1, 2, and 3 Fire systems will normally install minimum protection (approved double detector check valve assembly) **Standard ASSE 1048** to prevent stagnant waters from back flowing into the public potable water system.

Class 4 Fire systems will normally install a backflow protection at the service connection. The type (air gap, reduced pressure detector backflow prevention assembly **Standard ASSE 1047**, or double detector check valve assembly **Standard ASSE 1048**) will generally depend on the quality of the auxiliary supply.

Class 4 and 5 Fire systems normally install a maximum protection (reduced pressure detector check backflow prevention assembly) to protect the public potable water system. Detector Assembly **Standard ASSE 1047**.

Class 6 Fire system protection would depend on the requirements of both industry and fire protection and could only be determined by a survey of the premises.

A meter (compound or detector check) is not normally permitted as part of a backflow protection assembly. However, an exception may be made if the meter and backflow prevention assembly are specifically designed for that purpose.

There are also chemicals, such as liquid foam concentrates used for fighting certain types of fires that are toxic and, therefore, recommend maximum protection. A Reduced Pressure Detector Check Backflow Preventer Assembly, **Standard ASSE 1047**.

NOTE: Where backflow protection is required on an industrial-domestic service that is located on the same premises, backflow protection should be provided on the fire service connection. The industrial-domestic system and fire systems in Classes 1, 2, 3, 4, 5 and 6 should have adequate protection for the highest degree of hazard affecting either system.

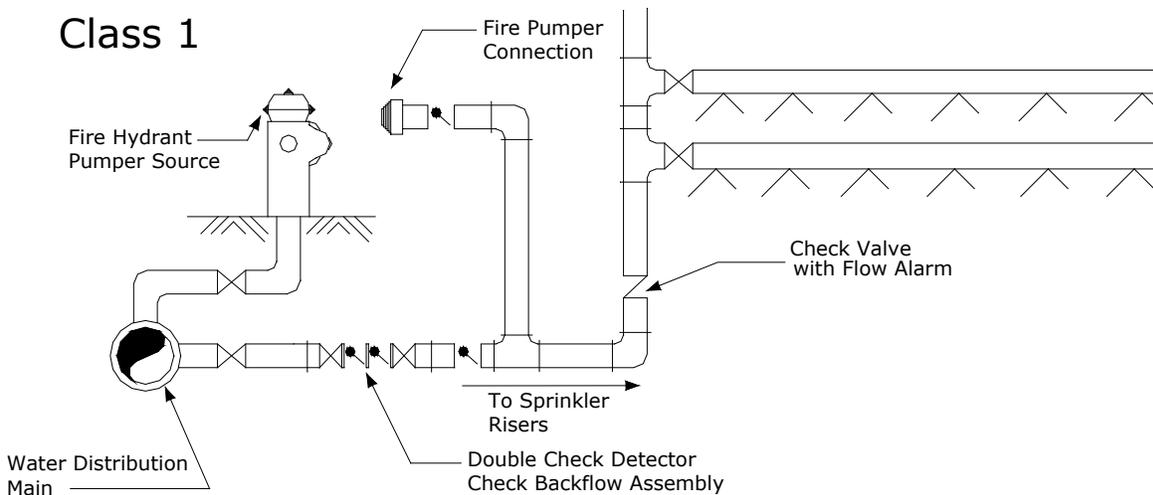
Installing a backflow assembly on an existing fire suppression system may have significant adverse effects on the hydraulic performance. The original design or retrofit of any backflow assembly on a dedicated fire line service should be based on requirements of Orange County Fire Department or a Fire Protection System Contractor using approved NFPA standards and Florida CHAPTER 4A-46, F.A.C rules. If approved by the above agencies, Orange County Utilities recommends a Double Check Detector Check backflow assembly (standard ASSE-1048) on any non-chemical additive fire service line or a Reduced Pressure Principle detector check backflow assembly (standard ASSE-1047) with chemical additives such as antifreeze or anticorrosion inhibitor solutions. Like other situations encountered in cross connection control, the degree of backflow protection necessary for a particular fire-protection system will depend on specific conditions present. Generally, it is recommended that the potable water supply be protected when serving fire systems. Guidelines given in this chapter pertaining to fire booster pumps should also be noted.

Orange County Utilities shall be mindful of regulations pertaining to fire sprinkler service connections. These regulations may limit the utilities options for requiring backflow assemblies.

Pressure losses across backflow prevention assemblies do occur. This loss must be accounted for in the design or redesign of the fire protection system, if it is to function properly. This factor is particularly important when assemblies are added to existing fire-protection systems.

Fire Sprinkler Plan/Calculations: As applicable, fire sprinkler plans must be provided for review by the Fire Sprinkler Contractor. In general, the installation of a new backflow prevention assembly on an existing fire service additionally requires fire sprinkler system calculations. These calculations serve to demonstrate that the sprinkler system functionality is not compromised by the resulting reduction in water pressure. Consultation with the local fire department and a registered sprinkler contractor is recommended.

Figure 11-2



Industrial fire protection systems consist of sprinklers, hose connection(s), and hydrants. Sprinkler systems may be dry or wet, open or closed. Systems of fixed-spray nozzles may be used indoors or outdoors for protection of flammable liquids and other hazardous processes. It is standard practice to equip automatic sprinkler systems with fire department pumper connections.

Class 2 Non-Metered Dedicated Fire Lines. Same as Class 1, except that booster pumps may be installed in the connections from the street mains (booster pumps do not affect the potable quality of the system). It is necessary that pressure in the water main be not reduced below 20 psi. Recommendation for installation of a Double Check Detector Check Backflow Assembly, **Standard ASSE 1048** at the water service connection.

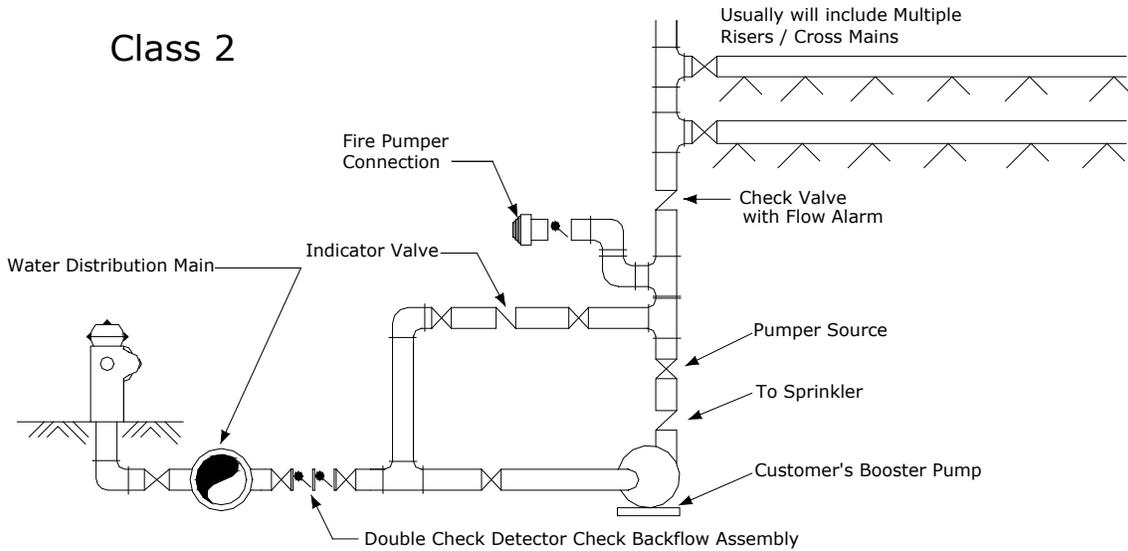
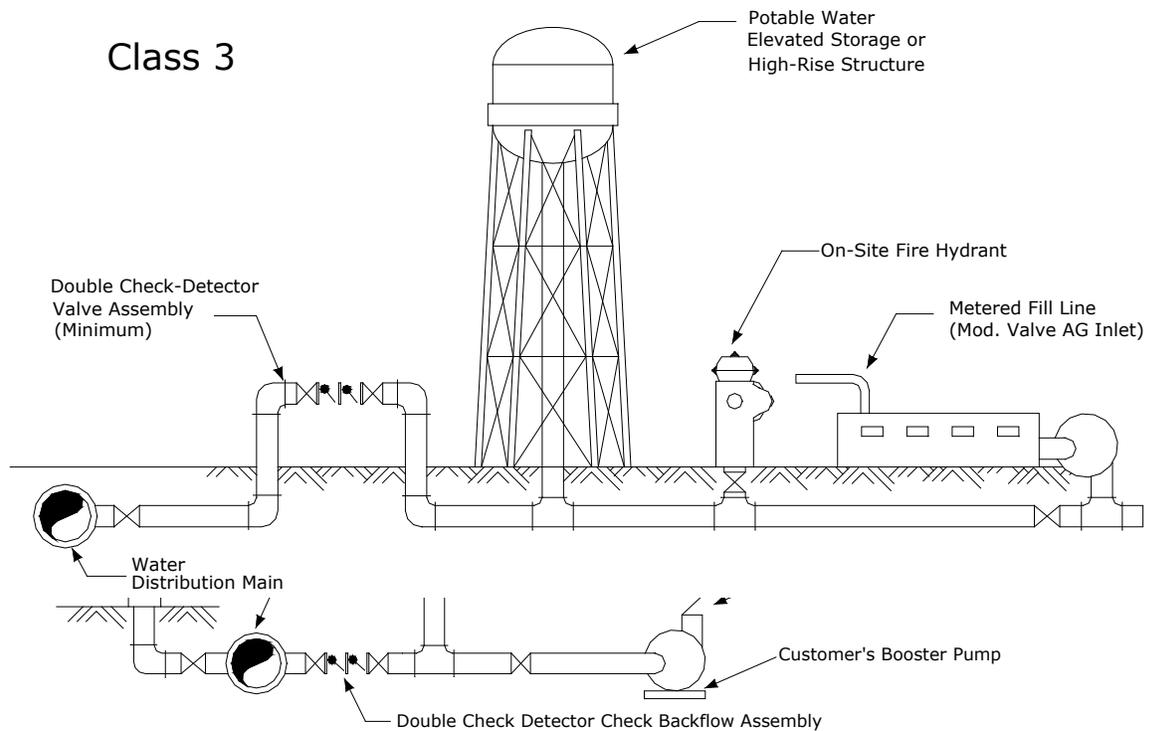


Figure 11-3

Figure 11-4



Class 3 Non-Metered Dedicated Fire Lines. Direct connection from public water supply mains, plus one or more of the following: elevated storage tanks; fire pumps taking suction from above ground covered reservoirs, or tanks; and pressure tanks. (All storage facilities are filled or connected to public water only, the water in the tanks is to be maintained in a potable condition.)

Class 4 Non-Metered Dedicated Fire Lines. Directly supplied from public mains, similar to Class 1 and Class 2, with an auxiliary water supply dedicated to fire department use and available to the premises, such as an auxiliary supply located within 1,700 ft. (518 m) of the pumper connection. Recommendation for installation of a Double Check Detector Check Backflow Preventer Assembly, **Standard ASSE 1048** at the water service connection and for non-chemical, or Reduced Pressure Detector Assembly, **Standard ASSE 1047** at the water service connection.

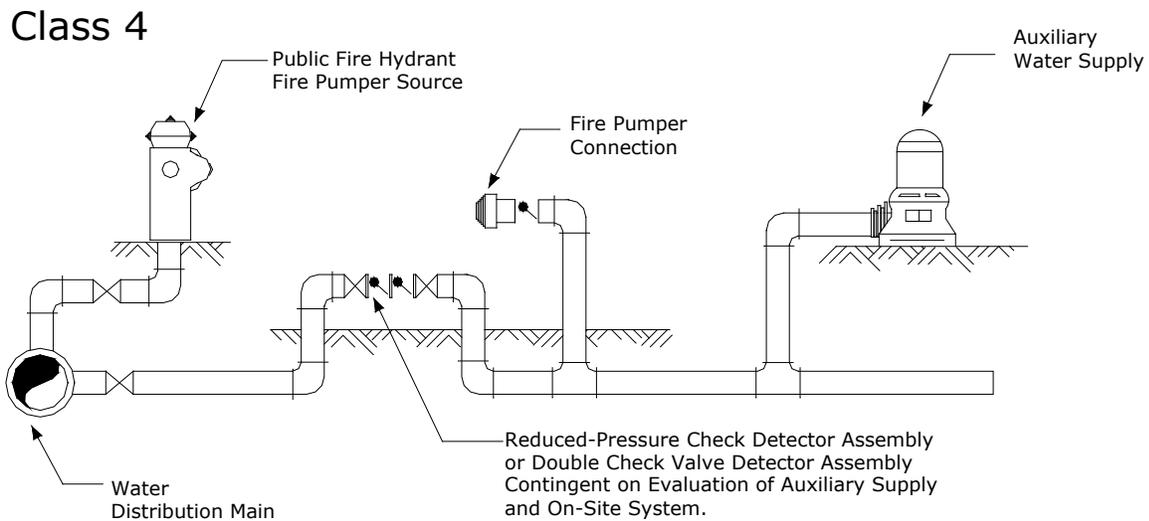


Figure 11-5

Class 5 Non-Metered Dedicated Fire Lines. Directly supplied from public mains and interconnected with auxiliary supplies, such as pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used. Recommendation for installation of a Reduced Pressure Detector Backflow Preventer Assembly, **Standard ASSE 1047** at the water service connection.

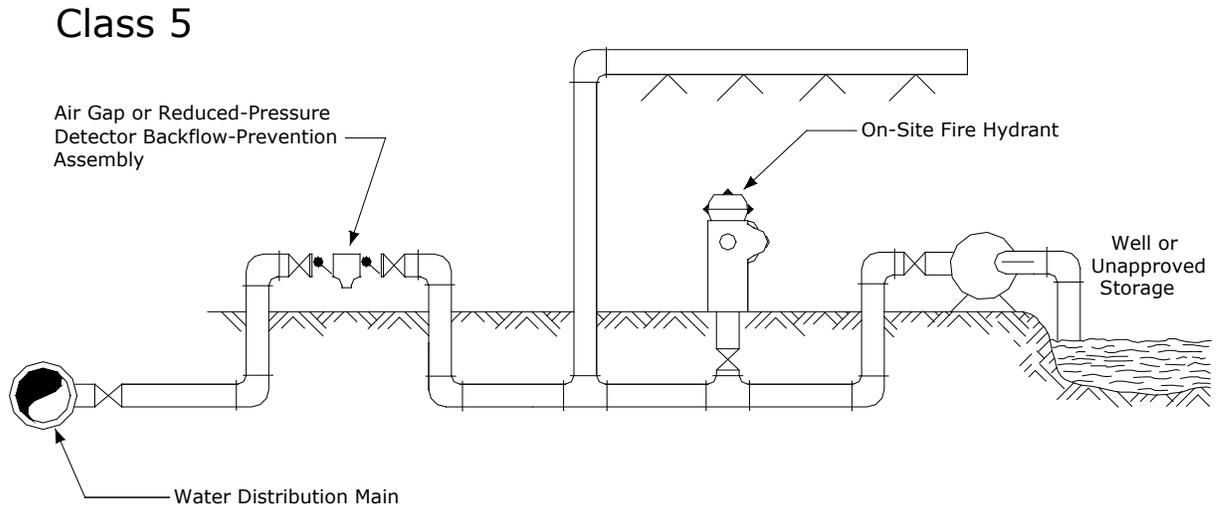


Figure 11-6

Class 6 Non-Metered Dedicated Fire Lines. Combined commercial or industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks (Figure 4-6). Recommendation for installation of a Double Check Detector Check Backflow Preventer Assembly, **Standard ASSE 1048** at the water service connection and for non-chemical, non-toxic or Reduced Pressure Detector Backflow Preventer Assembly / Toxic, **Standard ASSE 1047** at the water service connection.

Class 6

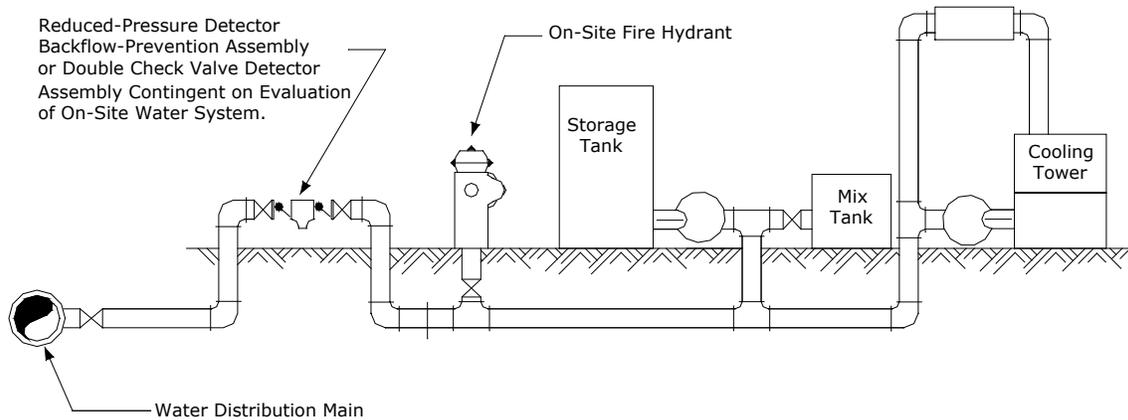


Figure 11-7

REFERENCES:

1. ASSE International, Cross Connection Control Professional Qualifications Standard, ASSE/IAPMO/ANSI Series 5000, November 2015
2. AWWA. M14 Backflow Prevention and Cross Connection Control, recommended practices, 4th Edition, American Water Works Association, 2015.
3. Orange County Utilities, 2011 Orange County Utilities Standards and Construction Specifications Manual, Orange County Utilities, 2011.
4. Orange County Code: Chapter 37. Water and Wastewater Chapter 37. Water and Wastewater . Article I. Orange County Water, Wastewater And Reclaimed Water Service Rules and Article III, Water Wells, 2017.



APPENDIX A

Orange County Utilities Water Division BACKFLOW PREVENTER FIELD TEST REPORT

PLEASE PRINT or TYPE

Customer Name: _____
 Service Address: _____ City: _____ State: _____ Zip: _____
 Account #: _____ Meter #: _____ Reading: _____
(required)

Company Name/Contractor: _____
 Mailing Address: _____ City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____ Email: _____
 Gauge Mfr.: _____ Serial #: _____ Calibration Date: _____

Check Areas

Point of Use:	Irrigation	Fire	Domestic	Reclaimed Service
Assembly:	Reduced Pressure		Double Check	Pressure Vacuum Breaker
Device:	Existing	New		

Mfr.: _____ Model #: _____ Size: _____ Serial #: _____

Device Location: _____

ASSEMBLY TEST

	Check Valve (CV) #1	CV # 2	Relief Valve	PVB	Shutoff Valves (SV)
Assembly Test Annual <input type="checkbox"/> Retest	Closed Tight Leaked PSID Across Check Valve _____	Closed Tight Leaked PSID Across Check Valve _____	Opened at _____ PSID Did Not Open Exercised	Air Inlet Opened at _____ PSID Did Not Open PSID CV Closed at _____ Leaked	SV # 1 Closure Leaked SV # 2 Closure Leaked
Repairs	Cleaned Replaced Repaired	Cleaned Replaced Repaired	Cleaned Replaced Repaired	Cleaned Replaced Repaired	Cleaned Replaced Repaired

This operational test Passed _____ or Failed _____. I certify this test to be a true operational representation of the above assembly at the time and date of this test. Date: _____ Time: _____

Comments:

Tester's Name (print): _____ Tester's Signature: _____

Certification #: _____ Issue Date: _____ OCU Tester Registration #: _____

Test Report must be maintained for a period of 10 years per DEP-62-550.720(3)

Provide Test Report To: Owner of the assembly and
 Orange County Utilities Water Division, c/o Cross Connection Control Program
 8100 Presidents Drive, Suite C, Orlando, Florida 32809
 Phone: 407-836-6970, Fax: 407-836-6830, Email: Water.Backflow@ocfl.net

Para más información, por favor llame al Departamento de Servicios Públicos del Condado de Orange y pida hablar con un representante en español. El número de teléfono es 407-836-6970.

Website: www.ocfl.net/CrossConnection



APPENDIX B
ORANGE COUNTY UTILITIES
WATER DIVISION
CROSS CONNECTION CONTROL
RECLAIMED WATER INSPECTION REQUEST

Requests for reclaimed water inspections must be submitted by email to Reclaimed.Water@ocfl.net. If you have any questions, please call 407-836-6994.

Every effort will be made to schedule requested inspections within two business days; however, it could take up to five business days before your inspection is completed. A trip fee will be charged for any inspection that has been requested by the builder/customer and is not ready when the inspector arrives.

Please provide the following information to request your reclaimed water inspection:
(Use one form for each address to be inspected.)

Subdivision/site name: _____

Address: _____

Company name: _____

Contact person: _____

Contact person phone number: _____

Date address will be ready for inspection: _____

Items required at time of inspection:

- Purple color-coded sprinkler outlets
- Hose bib vacuum breakers installed on all hose bibs
- Sprinklers must be properly adjusted to eliminate unnecessary overspray
- Both the reclaimed water and drinking water meters must be connected to their respective piping systems
- All piping, including sprinkler risers, must be color-coded Pantone Purple 522-C
- A county-approved backflow preventer must be installed directly on the **discharge side of the potable water meter box**. The backflow preventer must be in a separate box, cleaned from dirt and debris, and information on the device must be readable. (All backflow devices are required to be lead-free.)
Approved device: **Dual Check Standard ASSE 1024** with union connections.



APPENDIX C

Cross Connection Investigation Form

1: Contact information

Contact Name:	Date & Time:	Phone:	Email:
---------------	--------------	--------	--------

2: Possible C.C. Inquiry

What is the problem/issue?	
Residential <input type="checkbox"/> Non-Residential <input type="checkbox"/>	Inside <input type="checkbox"/> Outside <input type="checkbox"/>
Address:	
City:	Zip:
Category: Potable <input type="checkbox"/> Irrigation <input type="checkbox"/> Fire Service <input type="checkbox"/>	
When did this start?	
Has anyone else been affected?	
Is there a B.F.A. at the meter box? Yes <input type="checkbox"/> No <input type="checkbox"/>	

3: Investigation

How was the cross-connection discovered?	Direct observation..... <input type="checkbox"/> Meter running backwards..... <input type="checkbox"/> Water use decrease..... <input type="checkbox"/> Disinfectant residual monitoring... <input type="checkbox"/> Water quality monitoring..... <input type="checkbox"/>	Water quality complaint... <input type="checkbox"/> Illness/injury complaint.... <input type="checkbox"/> Result of investigation..... <input type="checkbox"/> Other:
Incident reported by:	Utilities Personnel <input type="checkbox"/> Owner/Occupant <input type="checkbox"/> Backflow Assembly Tester <input type="checkbox"/> Other:	

4: Possible Contaminant information

Contaminant type: Microbiological <input type="checkbox"/> Chemical <input type="checkbox"/> Physical <input type="checkbox"/> None <input type="checkbox"/>

Describe contaminant (please attach any lab analysis or MSDS, if available):	
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5: Possible Extent of Contamination

Estimated extent of contamination:	Contained	In distribution system
Estimated number of connections affected:	Residential	Non-residential
Estimated population affected:	Residential	Non-residential
Number of water quality complaints:	Describe water quality complaints:	

Action(s) requested by personnel to correct cross-connection:	None..... <input type="checkbox"/> Eliminate cross-connection... <input type="checkbox"/> Remove bypass..... <input type="checkbox"/> Install new preventer..... <input type="checkbox"/> For contaminant protection <input type="checkbox"/> For fixture protection..... <input type="checkbox"/>	Change existing preventer. <input type="checkbox"/> Repair/replumb..... <input type="checkbox"/> Reinstall correctly..... <input type="checkbox"/> Replace with same type... <input type="checkbox"/> Upgrade type..... <input type="checkbox"/> Other:
Action(s) requested accomplished?	Yes <input type="checkbox"/> Date: No <input type="checkbox"/> If no, explain:	

9: Cost of Incident

Item	Personnel Hours Expended	Cost to County	Cost to Premises Owner
Investigation			
Restoration of water quality			
Correction of cross-connection incident			
Litigation and/or settlement			
Other:			

10: Additional Notes

APPENDIX D

SELECTED PORTIONS OF SECTION 608, FLORIDA BUILDING 2007 PLUMBING CODE PROTECTION OF POTABLE WATER SUPPLY

608.1 General. A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through Cross-connections or any other piping connections to the system. Backflow preventer applications shall conform to Table 608.1, except as specifically stated in Sections 608.2 through 608.16.10.

608.2 Plumbing fixtures. The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1.

608.3 Devices, appurtenances, appliances and apparatus. All devices, appurtenances, appliances and apparatus intended to serve some special function, such as sterilization, distillation-processing, cooling, or storage of ice or foods, and that connect to the water supply system, shall be provided with protection against backflow and contamination of the water supply system. Water pumps, filters, softeners, tanks, commercial drinking water dispensers and all other appliances and devices that handle or treat potable water shall be protected against contamination.

608.3.1 Special equipment, water supply protection. The water supply for hospital fixtures shall be protected against backflow with a reduced pressure principle backflow preventer, an atmospheric or spill-proof vacuum breaker, or an air gap. Vacuum breakers for bedpan washer hoses shall not be located less than 5 feet (1524 mm) above the floor. Vacuum breakers for hose connections in health care or laboratory areas shall not be less than 6 feet (1829 mm) above the floor.

608.4 Water service piping. Water service piping shall be protected in accordance with Sections 603.2 and 603.2.1.

608.5 Chemicals and other substances. Chemicals and other substances that produce either toxic conditions, taste, odor or discoloration in a potable water system shall not be introduced into, or utilized in, such systems.

608.6 Cross-connection control. Cross connections shall be prohibited, except where approved protective devices are installed.

608.6.1 Cross connections between a private water supply and a potable public supply shall be prohibited.

608.8 Identification of potable and non-portable water. In all buildings where two or more water distribution systems, one potable water and the other non-potable water, are installed, each system shall be identified either by color marking or metal tags as required by ASME A13.1. Reclaimed water systems shall be identified using color-coded Pantone Purple 522C and marked with the statement "NONPOTABLEWATER-NOT FOR HUMAN CONSUMPTION."

608.10 Reuse of piping. Piping that has been utilized for any purpose other than conveying potable water shall not be utilized for conveying potable.

608.13 Backflow protection. Means of protection against backflow shall be provided in accordance with Sections 608.13.1 through 608.13.9.

Backflow Preventers applications

ASSEMBLY or DEVICE	DEGREE OF HAZARD	APPLICATION	APPLICABLE STANDARDS
Air Gap	High or low hazard	Backsiphonage or back pressure	ASME A112.1.2
Reduced Pressure Assembly Backflow Preventer	High or Low hazard	Back-pressure or backsiphonage Size 3/8" – 16"	ASSE 1013 AWWA C511 CSA CAN/CSA-B64.4
Reduced Pressure Detector Assembly Backflow Preventer	High or Low hazard	Backsiphonage or back-pressure (Fire sprinkler systems)	ASSE 1047
Double Check Backflow Prevention Assembly	Low Hazard	Back-pressure or backsiphonage Sizes 3/8" – 16"	ASSE 1015 AWWA C510
Double Check Detector Assembly Backflow Preventer	Low Hazard	Back-pressure or Backsiphonage (Fire sprinkler systems) Size 1 1/2" – 16"	ASSE 1048
Pressure Vacuum Breaker Assembly	High or Low Hazard	Backsiphonage only Sizes 1/2" – 2"	ASSE 1020
Hose-connection Vacuum Breaker	High or Low hazard	Low head back-pressure or backsiphonage Sizes 1/2", 3/4" 1"	ASSE 1011
Spill-proof vacuum breaker	High or low hazard	Backsiphonage only Sizes 1/4" – 2"	ASSE 1056

608.14 Location of backflow Preventer. Access shall be provided to backflow preventers as specified by the installation instructions of the approved manufacturer.

608.14.1 Outdoor enclosures for backflow prevention devices. Outdoor enclosures for backflow prevention devices shall comply with ASSE 1060.

608.15 Protection of potable water outlets. All potable water openings and outlets shall be protected against backflow in accordance with Section 608.15.1, 608.15.2, 608.15.3, 608.15.4, 608.15.4.1 or 608.15.4.2.

608.15.4.2 Hose connections. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be

protected by an atmospheric-type or pressure-type vacuum breaker or a permanently attached hose connection vacuum breaker.

608.16.4 Connections to automatic fire sprinkler system and standpipe systems. The potable water supply to automatic fire sprinkler and standpipe systems shall be protected against backflow by a double check-valve assembly or a reduced pressure principle backflow preventer.

Exceptions:

1. Where systems are installed as a portion of the water distribution system in accordance with the requirements of this code and are not provided with a fire department connection, isolation of the water supply system shall not be required.

2. Isolation of the water distribution system is not required for deluge, precaution or dry pipe systems.

608.16.4.1 Additives or non-potable source. Where systems under continuous pressure contain chemical additives or antifreeze, or where systems are connected to a non-potable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow preventer. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle backflow preventer shall be permitted to be located so as to isolate that portion of the system. Where systems are not under continuous pressure, the potable water supply shall be protected against backflow by an air gap or a pipe applied atmospheric vacuum breaker conforming to ASSE 1001 or CSA B64.1.1.

608.16.5 Connections to lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric-type vacuum breaker, a pressure-type vacuum breaker or a reduced pressure principle backflow preventer. A valve shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow preventer.

608.16.6 Connections subject to back pressure. Where a potable water connection is made to a non-potable line, fixture, tank, vat, pump or other equipment subject to back-pressure, the potable water connection shall be protected by a reduced pressure principle backflow preventer.

608.16.7 Chemical dispensers. Where chemical dispensers connect to the potable water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, 608.13.2, 608.13.5, 608.13.6, 608.13.8 or 608.13.9

608.16.8 Portable cleaning equipment. Where the portable cleaning equipment connects to the water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, 608.13.2, 608.13.3, 608.13.7 or 608.13.8.

SELECTED PORTIONS OF SECTION 312 TESTING AND INSPECTIONS

312.9 Inspection and testing of backflow prevention assemblies. Inspection and testing shall comply with Sections 312.9.1 and 312.9.2.

312.9.1 Inspections. Inspections shall be made of all backflow prevention assemblies and air gaps to determine whether they are operable.

312.9.2 Testing. Reduced pressure principle backflow preventer assemblies, double check-valve assemblies, pressure vacuum breaker assemblies, reduced pressure detector fire protection backflow prevention assemblies, double check detector fire protection backflow prevention assemblies, hose connection backflow preventers, and spill-proof vacuum breakers shall be tested at the time of installation and immediately after repairs or relocation. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE, 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA, B64.10.1

Florida Plumbing Code: C102.4 Coloring
All other non-potable (gray water systems) yellow background with black lettering.

APPENDIX E

PERMITTING AND CONSTRUCTION OF PUBLIC WATER SYSTEMS PART III: CONSTRUCTION, OPERATION, AND MAINTENANCE

62-555.360 Cross-Connection Control for Public Water Systems.

(1) Cross-connections, as defined in Rule 62-550.200, F.A.C., are prohibited unless appropriate backflow protection is provided to prevent backflow through the cross-connection into the public water system. This does not prohibit a public water system from being interconnected to another public water system of the same type without backflow protection (i.e., a community water system [CWS] may be interconnected to another CWS without backflow protection, a non-transient non-community water system [NTNCWS] may be interconnected to another NTNCWS without backflow protection, and a transient non-community water system [TWS] may be interconnected to another TWS without backflow protection).

(a) Appropriate backflow protection for various applications is described in *Recommended Practice for Backflow Prevention and Cross-Connection Control: AWWA Manual M14*, Third Edition, as clarified and modified in paragraphs (b) and (c) below and in Table 62-555.360-2, which appears at the end of this section. The third edition of *AWWA Manual M14* is incorporated herein by reference; is available from the American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235, www.awwa.org; and is available for review at the Department of Environmental Protection, Source and Drinking Water Program, MS 3520, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, at the Department of Environmental Protection district offices, and at the Approved County Health Departments.

(b) Except for the temporary cross-connections described in paragraph (c) below, cross-connections between a public water system and a wastewater system or reclaimed water system are prohibited (i.e., an air gap shall be maintained between any public water system and any wastewater system or reclaimed water system). The Department shall allow an exception to this requirement if the supplier of water provides justification for the exception and provides alternative backflow protection that achieves a level of reliability and public health protection similar to that achieved by an air gap (e.g., two biannually-tested reduced-pressure principle assemblies installed in series); however, in no case shall the Department allow a single, annually-tested mechanical backflow preventer to be used as the only protection against backflow of wastewater or reclaimed water into a public water system.

(c) Temporary cross-connections may be made between a public water system and a wastewater system or reclaimed water system for either of the following purposes:

1. To supply water for flushing or testing a new wastewater force main or new reclaimed water main, in which case a double check valve assembly or reduced-pressure principle assembly shall be provided at the cross-connection.
2. To supply water for temporarily operating a new reclaimed water main that has not yet been connected to a reclaimed water supply, in which case a reduced-pressure principle assembly shall be provided at the cross-connection.

(2) Each community water system (CWS) shall establish and implement a cross-connection control program utilizing backflow protection at or for service connections from the CWS in order to protect the CWS from contamination caused by cross-connections on customers' premises. 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*, Third Edition, as clarified and modified in paragraph (a) below. The third edition of *AWWA Manual M14* is incorporated herein by reference and is available as indicated in paragraph 62-555.360(1)(a), F.A.C.

(a) The minimum components that each CWS shall include in its written cross-connection control plan are listed and described in Table 62-555.360-1, which appears at the end of this section. The categories of customers for which each CWS shall ensure backflow protection is provided at or for the service connection from the CWS to the customer are listed in Table 62-555.360-2, which appears at the end of this section.

(b) Each CWS serving more than 10,000 persons shall prepare and submit cross-connection control program annual reports. The first annual report shall cover calendar year 2016, and subsequent annual reports shall cover each calendar year thereafter. These reports shall be prepared using Form 62-555.900(13), Cross-Connection Control Program Annual Report, effective 5-5-14, which is incorporated herein by reference and which is available as described in Rule 62-555.900, F.A.C., and at <http://www.flrules.org/Gateway/reference.asp?No=Ref-04104>. These reports shall 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.

(3) 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.

Table 62-555.360-1: Minimum Components that Each Community Water System (CWS) Shall Include in Its Written Cross-Connection Control (CCC) Plan (Effective 5-5-14)

Component Number and Description
<p>I. Legal authority for the CWS's CCC program – i.e., an ordinance, a bylaw or resolution, or water service rules and regulations. The legal authority shall include or reference Components 2 and 3 below.</p>
<p>II. The CWS's policy establishing where backflow protection at or for service connections from the CWS is mandatory.</p> <p>A. This policy shall identify categories of customers for which the CWS is requiring backflow protection at or for the service connection to the customer and shall specify the minimum backflow protection that the CWS is requiring for each such category of customers.</p> <p>B. This policy shall be no less stringent than Table 62-555.360-2, which appears at the end of Rule 62-555.360, F.A.C.</p>
<p>III. The CWS's policy regarding ownership, installation, inspection/testing, and maintenance of backflow protection that the CWS is requiring at or for service connections from the CWS.</p> <p>A. This policy shall specify whether the CWS or customer is responsible for installation, inspection/testing, and maintenance of backflow protection being required at or for service connections.</p> <p>B. This policy shall specify design and performance standards, and shall specify installation criteria, for new backflow protection being required at or for service connections. Installation criteria shall be consistent with installation criteria in <i>AWWA Manual M14</i> as incorporated into subsection 62-555.360(2), F.A.C., and shall assure the backflow protection is installed as close as practical to the CWS's meter or customer's property line but, in all cases, before the first distribution line off of the customer's water service line.</p> <p>C. This policy shall specify the frequency for inspecting air gaps (AGs) being required at or for service connections and shall specify qualifications for persons inspecting such AGs. All AGs being required at or for service connections pursuant to Table 62-555.360-2, which appears at the end of Rule 62-555.360, F.A.C., shall be inspected at least annually.</p> <p>D. This policy shall specify the frequency for testing backflow preventer assemblies¹ being required at or for service connections, shall specify qualifications for persons testing such assemblies, and shall specify test procedures for such assemblies. Assemblies being required at or for non-residential service connections² pursuant to Table 62-555.360-2, which appears at the end of Rule 62-555.360, F.A.C., shall be tested after installation or repair and at least annually thereafter and shall be repaired if they fail to meet performance standards. Assemblies being required at or for residential service connections² pursuant to Table 62-555.360-2 shall be tested after installation or repair and at least biennially thereafter and shall be repaired if they fail to meet performance standards.</p> <p>E. This policy shall specify the frequency for refurbishing or replacing dual check devices (DuCs) being required at or for service connections. DuCs being required at or for service connections pursuant to Table 62-555.360-2, which appears at the end of Rule 62-555.360, F.A.C., shall be refurbished or replaced at least once every 5 to 10 years or at a lesser frequency determined by the CWS if the CWS documents that the lesser frequency is appropriate based on data from spot-testing DuCs in its system or based on data from backflow sensing meters in its system.</p>
<p>IV. The CWS's procedures for evaluating customers' premises to establish the category of customer and the backflow protection being required at or for the service connection(s) from the CWS to the customer.³</p> <p>A. The CWS shall evaluate the customer's premises at a newly constructed service connection before the CWS begins supplying water to the service connection.</p> <p>B. The CWS shall evaluate the customer's premises at an existing – i.e., previously constructed – service connection whenever the customer connects to a reclaimed water distribution system, whenever an auxiliary water system is discovered on the customer's premises, whenever a prohibited or inappropriately protected cross-connection is discovered on the customer's premises, and whenever the customer's premises is altered under a building permit in a manner that could change the backflow protection required at or for a service connection to the customer.</p>
<p>V. The CWS's procedures for maintaining CCC program records.⁴</p> <p>A. The CWS shall maintain a current inventory of backflow protection being required at or for service connections from the CWS.</p> <p>B. The CWS shall maintain records of the installation, inspection/testing, and repair of backflow protection being required at or for service connections from the CWS.</p>

¹ Backflow preventer assemblies include the following: double check valve assemblies (DCs) and double check detector

assemblies (DCDAs); pressure vacuum breaker assemblies (PVBs); and reduced-pressure principle assemblies (RPs) and reduced-pressure principle detector assemblies (RPDAs).

² For the purpose of this table, “residential service connection” means any service connection, including any dedicated irrigation or fire service connection, that is two inches or less in diameter and that supplies water to a building, or premises, containing only dwelling units; and “non-residential service connection” means any other service connection.

³ CWSs may evaluate customers’ premises using questionnaires, reviews of construction plans or pertinent records, on-site inspections, or any combination thereof.

⁴ CWSs may maintain all records in either electronic or paper format.

Table 62-555.360-2: Categories of Customers for Which Each Community Water System (CWS) Shall Ensure Minimum Backflow Protection Is Provided at or for the Service Connection from the CWS to the Customer (Effective 5-5-14)

Category of Customer	Minimum Backflow Protection ¹ to Be Provided at or for the Service Connection from the CWS to the Customer
Beverage processing plant, including any brewery	DC if the plant presents a low hazard ² ; or RP if the plant presents a high hazard ²
Cannery, packing house, rendering plant, or any facility where fruit, vegetable, or animal matter is processed, excluding any premises where there is only restaurant or food service facility	RP
Car wash	RP
Chemical plant or facility using water in the manufacturing, processing, compounding, or treatment of chemicals, including any facility where a chemical that does not meet the requirements in paragraph 62-555.320(3)(a), F.A.C., is used as an additive to the water	RP
Dairy, creamery, ice cream plant, cold-storage plant, or ice manufacturing plant	RP ³
Dye plant	RP
Film laboratory or processing facility or film manufacturing plant, excluding any small, noncommercial darkroom facility	RP
Hospital; medical research center; sanitarium; autopsy facility; medical, dental, or veterinary clinic where surgery is performed; or plasma center	RP
Laboratory, excluding any laboratory at an elementary, middle, or high school	RP
Laundry (commercial), excluding any self-service laundry or Laundromat	RP
Marine repair facility, marine cargo handling facility, or boat moorage	RP
Metal manufacturing, cleaning, processing, or fabricating facility using water in any of its operations or processes, including any aircraft or automotive manufacturing plant	DC if the facility presents a low hazard ² ; or RP if the facility presents a high hazard ²
Mortuary	RP
Premises where oil or gas is produced, developed, processed, blended, stored, refined, or transmitted in a pipeline or where oil or gas tanks are repaired or tested, excluding any premises where there is only a fuel dispensing facility	RP
Premises where there is an auxiliary or reclaimed water system ^{4,5}	<p>A. At or for a residential service connection⁶: DuC⁷</p> <p>B. At or for a non-residential service connection⁶: DC if the auxiliary or reclaimed water is a low hazard^{8,9}; or RP if the auxiliary or reclaimed water is a high hazard^{8,9}</p>
Premises where there is a cooling tower	RP

Category of Customer	Minimum Backflow Protection ¹ to Be Provided at or for the Service Connection from the CWS to the Customer
<p>Premises where there is an irrigation system that is using potable water and that...</p> <p>I. Is connected directly to the CWS's distribution system via a dedicated irrigation service connection</p> <p>II. Is connected internally to the customer's plumbing system</p>	<p>I. At or for a residential or non-residential dedicated irrigation service connection⁶: PVB if backpressure cannot develop in the downstream piping¹⁰; or RP if backpressure could develop in the downstream piping¹⁰</p> <p>II. None¹¹</p>
<p>Premises where there is a wet-pipe sprinkler, or wet standpipe, fire protection system that is using potable water and that...</p> <p>I. Is connected directly to the CWS's distribution system via a dedicated fire service connection¹²</p> <p>II. Is connected internally to the customer's plumbing system</p>	<p>I.A. At or for a residential dedicated fire service connection⁶: DuC if the fire protection system contains no chemical additives and is not connected to an auxiliary water system⁴; or RP or RPDA if the fire protection system contains chemical additives or is connected to an auxiliary water system^{4,13}</p> <p>I.B. At or for a non-residential dedicated fire service connection⁶: DC or DCDA if the fire protection system contains no chemical additives and is not connected to an auxiliary water system⁴; or RP or RPDA if the fire protection system contains chemical additives or is connected to an auxiliary water system^{4,13}</p> <p>II. None¹¹</p>
Radioactive material processing or handling facility or nuclear reactor	RP
Paper products plant using a wet process	RP
Plating facility, including any aircraft or automotive manufacturing plant	RP
Restricted-access facility	RP
Steam boiler plant	RP
Tall building – i.e., a building with five or more floors at or above ground level	DC if the customer has no potable water distribution lines connected to the suction side of a booster pump; or RP if the customer has one or more potable water distribution lines connected to the suction side of a booster pump
Wastewater treatment plant or wastewater pumping station	RP
Customer supplied with potable water via a temporary or permanent service connection from a CWS fire hydrant	Varies ¹⁴

¹ Means of backflow protection, listed in an increasing level of protection, include the following: a dual check device (DuC); a double check valve assembly (DC) or double check detector assembly (DCDA); a pressure vacuum breaker assembly (PVB); a reduced-pressure principle assembly (RP) or reduced-pressure principle detector assembly (RPDA); and an air gap. A PVB may not be used if backpressure could develop in the downstream piping.

² The CWS shall determine the degree of hazard. “Low hazard” or “non-health hazard” and “high hazard” or “health hazard” are defined in *AWWA Manual M14* as incorporated in paragraph 62-555.360(1)(a), F.A.C., and subsection 62-555.360(2), F.A.C.

³ A DC may be provided if it was installed before 5-5-14; and if such a DC is replaced on or after 5-5-14, it may be replaced with another DC.

⁴ For the purpose of this table, “auxiliary water system” means a pressurized system of piping and appurtenances using auxiliary water, which is water other than the potable water being supplied by the CWS and which includes water from any natural

source such as a well, pond, lake, spring, stream, river, etc., includes reclaimed water, and includes other used water or industrial fluids described in *AWWA Manual M14* as incorporated in paragraph 62-555.360(1)(a), F.A.C., and subsection 62-555.360(2), F.A.C.; however, “auxiliary water system” specifically excludes any water recirculation or treatment system for a swimming pool, hot tub, or spa. (Note that reclaimed water is a specific type of auxiliary water and a reclaimed water system is a specific type of auxiliary water system.)

⁵ The Department shall allow an exception to the requirement for backflow protection at or for a residential or non-residential service connection from a CWS to premises where there is an auxiliary or reclaimed water system if all of the following conditions are met:

- The CWS is distributing water only to land owned by the owner of the CWS.
- The owner of the CWS is also the owner of the entire auxiliary or reclaimed water system up to the points of auxiliary or reclaimed water use.
- The CWS conducts at least biennial inspections of the CWS and the entire auxiliary or reclaimed water system to detect and eliminate any cross-connections between the two systems.

⁶ For the purpose of this table, “residential service connection” means any service connection, including any dedicated irrigation or fire service connection, that is two inches or less in diameter and that supplies water to a building, or premises, containing only dwelling units; and “non-residential service connection” means any other service connection.

⁷ A DuC may be provided only if there is no known cross-connection between the plumbing system and the auxiliary or reclaimed water system on the customer’s premises. Upon discovery of any cross-connection between the plumbing system and any reclaimed water system on the customer’s premises, the CWS shall ensure that the cross-connection is eliminated. Upon discovery of any cross-connection between the plumbing system and any auxiliary water system other than a reclaimed water system on the customer’s premises, the CWS shall ensure that the cross-connection is eliminated or shall ensure that the backflow protection provided at or for the service connection is equal to that required at or for a non-residential service connection.

⁸ Reclaimed water regulated under Part III of Chapter 62-610, F.A.C., is a low hazard unless it is stored with surface water in a pond that is part of a stormwater management system, in which case it is a high hazard; well water is a low hazard unless determined otherwise by the CWS; industrial fluids and used water other than reclaimed water are high hazards unless determined otherwise by the CWS; reclaimed water not regulated under Part III of Chapter 62-610, F.A.C., and surface water are high hazards.

⁹ Upon discovery of any cross-connection between the plumbing system and any reclaimed water system on the customer’s premises, the CWS shall ensure that the cross-connection is eliminated.

¹⁰ A DC may be provided if both of the following conditions are met:

- The dedicated irrigation service connection initially was constructed before 5-5-14.
- No chemicals are fed into the irrigation system.

¹¹ The CWS may rely on the internal backflow protection required under the *Florida Building Code* or the predecessor State plumbing code. The CWS may, but is not required to, ensure that such internal backflow protection is inspected/tested and maintained the same as backflow protection provided at or for service connections from the CWS.

¹² The Department shall allow an exception to the requirement for backflow protection at or for a residential or non-residential dedicated fire service connection from a CWS to a wet-pipe sprinkler, or wet standpipe, fire protection system if both of the following conditions are met:

- The fire protection system was installed and last altered before 5-5-14.
- The fire protection system contains no chemical additives and is not connected to an auxiliary water system as defined in Footnote 4.

¹³ Upon discovery of any cross-connection between the fire protection system and any reclaimed water system on the customer’s premises, the CWS shall ensure that the cross-connection is eliminated.

¹⁴ The CWS shall ensure that backflow protection commensurate with the degree of hazard is provided at or for the service connection from its fire hydrant.

Rulemaking Authority 403.086(8), 403.853(3), 403.861(9) FS. Law Implemented 403.086(8), 403.852(12), 403.853(1), 403.855(3), 403.861(17) FS. History—New 11-19-87, Formerly 17-22.660, Amended 1-18-89, 1-3-91, 1-1-93, Formerly 17-555.360, Amended 8-28-03, 5-5-14.

APPENDIX F

REUSE OF RECLAIMED WATER AND LAND APPLICATION PART VII: INDUSTRIAL USES OF RECLAIMED WATER

62-610.658 Access Control and Advisory Signs.

- (1) For all systems, advisory signs shall be posted around the portions of the industrial site in which reclaimed water is used and at the main entrances to the industrial site to notify employees at the industrial site and the public of the nature of the reclaimed water use.
- (2) Access control beyond what is normally provided by the industry is not required.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 1-9-96.

Cross-Connection Control and Protection of the Reclaimed Water Supply

- (1) No cross-connections to potable water systems shall be allowed.
- (2) For all systems, there shall be readily identifiable "non-potable" or "do not drink" notices, marking, or coding on application/distribution facilities and appurtenances.
- (3) Protection of Reclaimed Water Supply.
 - (a) The return of reclaimed water to the reclaimed water distribution system after the reclaimed water has been delivered to an industrial facility is prohibited. This prohibition shall not apply to industrial sites which were using reclaimed water before January 1, 1996, or which were identified as future users of reclaimed water in a complete permit application received by the Department before January 1, 1996.
 - (b) The permittee shall conduct an evaluation of the potential for cross-connections and backflow to the reclaimed water distribution system. This analysis shall include an evaluation of the types of substances present at the industrial site which could potentially backflow into the reclaimed water system and the risk associated with possible backflow. The applicant shall evaluate the need for backflow prevention devices on the reclaimed water connection to the industrial facility. This analysis shall be included in the engineering report. A backflow prevention device shall be provided on the reclaimed water service connection to the industrial site; unless the evaluation in the engineering report provides reasonable assurances that there is minimal risk of cross-connection or backflow with contamination of the reclaimed water supply. This requirement for backflow prevention devices shall not apply to industrial sites which were using reclaimed water before January 1, 1996 or which were identified as future users of reclaimed water in a complete permit application received by the Department before January 1, 1996.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 4-4-89, Amended 4-2-90, Formerly 17-610.660, Amended 1-9-96.

APPENDIX G

REFERENCE: DEPARTMENT OF INSURANCE DIVISION OF STATE FIRE MARSHAL UNIFORM FIRE SAFETY RULES AND STANDARDS

CHAPTER 4A-46, F.A.C. FIRE PROTECTION CONTRACTORS AND SYSTEMS

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- 4A-46.005 Definitions
- 4A-46.010 Submission of the Application
- 4A-46.015 Testing
- 4A-46.016 Insurance Requirements
- 4A-46.017 Required Continuing Education

PART II GENERAL PROVISIONS

- 4A-46.025 Scope
- 4A-46.030 Definitions
- 4A-46.035 Standards of National Fire Protection Association to be Complied With
- 4A-46.040 Installation Requirements for Automatic Sprinkler Systems Employing Water as the Extinguishing Agent
- 4A-46.041 Inspection, Testing and Maintenance Requirements for Fire Protection Systems

PART I APPLICATION PROCEDURES

4A-46.001 Scope.

The provisions of this part shall apply to those individuals wishing to be qualified by the State Fire Marshal as a contractor of fire protection systems in this state pursuant to the provisions of Section 633.521, Florida Statutes.

Specific Authority : 633.01, 633.517 (1) F.S.

Law Implemented : 633.521, 633.524, 633.534 F.S.

History : New 10-14-86.

4A-46.005 Definitions.

For purposes of this part, the following terms shall have the following meanings:

- (1) "Contractor" shall mean a "Contractor I, II, III, IV, or V" as defined in Section 633.021 (5)(a)-(e), Florida Statutes.
- (2) "Fire Protection System" shall mean a system as defined in Section 633.021(7), Florida Statutes.
- (3) "Employed by" shall mean that point at which a person earns compensation, directly or indirectly, from a contractor.

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(4) "Point-of-service" shall mean that point as defined in Section 633.521(16), Florida Statutes.

(5) "Sprinkler System" shall mean that system as defined in Section 633.021(20), Florida Statutes.

Specific Authority : 633.01, 633.517(1) F.S.

Law Implemented : 633.021(5), (7), (16), (20), 633.521 F.S.

History : New 10-14-86, Amended 12-21-88

4A-46.010 Submission of the Application.

- (1) The applicant shall submit an application on a form furnished by the division which shall conform with Section 633.534, Florida Statutes.
- (2) The application shall be accompanied by a fee as prescribed in Section 633.524, Florida Statutes.
- (3) (a) As a prerequisite to challenging the examination as a Contractor I, II, or III, the applicant shall provide evidence of four (4) years proven experience in the employment of a Contractor I, II, or III, or a combination of experience and education equivalent thereto.
 1. "Experience in the employment of a contractor", as required by Section 633.521(3), Florida Statutes, must be gained from full-time employment by a contractor, such employment relating to technical areas. For purposes of this rule chapter, "technical areas" means those activities engaged in by a contractor and participated in by the applicant which provide experience in laying out, fabricating, installing, inspecting, altering, repairing, or servicing fire protection systems. For purposes of this rule chapter, four (4) years proven experience as a certified plumbing contractor, licensed pursuant to the provisions of Chapter 489, Florida Statutes, may be offered toward the experience requirements for a Contractor I or II and shall be considered equivalent to two (2) years proven experience in the employment of a contractor. A certified plumbing contractor shall offer no more than 4 years as a certified plumbing contractor toward the 4 years' experience requirement in Section 633.521, Florida Statutes. The applicant's experience must be verified by the contractor employing the applicant. The required verification shall be in the form of a letter from the employer, on company stationery, describing the applicant's duties, the kinds of jobs he worked on; his dates of employment; and any other information reasonably calculated to provide the division with an informed understanding of the applicant's work experience. An applicant offering self-employment experience shall provide verification in the form of letters from customers, and others familiar with his work. It is the applicant's responsibility to furnish the required verification. The experience will be evaluated to determine an applicant's qualifications for the class of certificate requested; or,

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2. The division will accept a current NICET Level III or IV certification as a Fire Protection Engineering Technician in the subfield of Automatic Sprinkler System Layout, for contractor I and II applicants, and will accept a current NICET Level III or IV certification as a Fire Protection Engineering Technician in the subfield of Special Hazards System Layout, for Contractor III applicants, issued by the National Institute for Certification in Engineering technologies in Alexandria, Virginia; or,
 3. The applicant can provide evidence of a combination of experience and education equivalent to four (4) years proven experience in the employment of a contractor. Acceptable education shall include, but not be limited to, a bachelor degree from a four (4) year college or university with a major in mechanical engineering, civil engineering, fire science engineering technology, or equivalent coursework; or an associate degree (2 years) with a major in fire science engineering technology or fire protection engineering technology. The applicant must furnish official transcripts to substantiate all degrees and coursework. The curriculum, degree, date degree awarded, and all engineering, fire science, and fire protection courses must be clearly identified on the transcripts. Acceptable experience to combine with the education offered shall be provided in the same form as required under subparagraph 1., above. For purposes of combining education and work experience, the number of hours worked in part-time employment will be counted as the appropriate percentage of full-time employment.
 4.
 - a. Applicants for certification as a Contractor I who are offering 4 years proven experience as a certified plumbing contractor as the equivalent of 2 years proven experience in the employment of a contractor shall combine that experience with a NICET Level III or IV certificate; or with 18 credit hours from a 4-year college or university, or a junior or community college in courses which teach the material in the National Fire Protection Association standards on which the applicant will be tested; or with other equivalent coursework.
 - b. Applicants for certification as a Contractor II who are offering 4 years proven experience as a certified plumbing contractor as the equivalent of 2 years proven experience in the employment of a contractor shall combine that experience with a NICET Level III or IV certificate; or with 15 credit hours from a 4-year college or university, or a junior or community college in courses which teach the material in the National Fire Protection Association standards on which the applicant will be tested; or with other equivalent coursework.
- (b) As a prerequisite to challenging the examination as a Contractor IV, the applicant shall provide evidence of two (2) years proven experience in the employment of a Contractor I, II, or IV, or a combination of equivalent education and experience, which combination need not include experience in the employment of a contractor.

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For purposes of combining education and experience, education in the areas described in paragraph (a) 3., above, including at least 3 credit hours from a 4-year college or university or junior or community college in courses which teach the material in the National Fire Protection Association standards on which the applicant will be tested; or other equivalent coursework; and experience in the areas described in paragraph (a) 1., above, shall be provided. In addition, the division will accept a current NICET Level III or IV Certification as a Fire Protection Engineering Technician in the subfield of Automatic Sprinkler System Layout, issued by the National Institute for Certification in Engineering Technologies in Alexandria, Virginia.

- (c) As a prerequisite to challenging the examination as a Contractor V, the applicant shall provide evidence of:
1. licensing as a certified underground utility contractor, pursuant to the provisions of chapter 489, Florida Statutes, which shall be submitted in the form of a copy of the license issued by the Department of Business and Professional Regulation, accompanied by a statement that the applicant certifies that he is the person named on the license; or
 2. employment by an individual licensed as a certified underground utility contractor pursuant to the provisions of Chapter 489, Florida Statutes, that the applicant has four (4) years' experience in the employment of a certified underground utility contractor, which shall be submitted in the form of a letter, on company stationery, signed by the certified underground utility contractor, describing the applicant's duties; the kinds of jobs he worked on; his dates of employment; and any other information reasonably calculated to provide the division with an informed understanding of the applicant's work experience; or
 3. A combination of education and experience equivalent to four (4) years proven experience in the employment of a certified underground utility contractor. For purposes of combining education and experience, the education in the areas described in paragraph (a)3., above, including at least 3 credit hours from a 4-year college or university or junior or community college in courses which teach the material in the National Fire Protection Association standards on which the applicant will be tested; or other equivalent coursework; and experience in the areas described in paragraphs (a)1., or (c)1., or 2., above, shall be provided.
- (d) For all classes of contractor applicants the division will accept other experience and education combinations which are equivalent to those described above.
- (4) The applicant shall not be approved to challenge a competency examination unless the applicant has substantiated employment experience or a combination of employment and education. The applicant is encouraged to submit documentation of all relevant experience and education since each instance of a combination prerequisite must necessarily be decided individually. When the review of the application has been completed the applicant will be notified in writing whether or not he has qualified to challenge the competency examination in accordance with the provisions of Chapter 120, Florida Statutes.

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FIRE PROTECTION CONTRACTORS AND SYSTEMS
PART I APPLICATION PROCEDURES

Specific Authority : 633.01, 633.517(1) F.S.

Law Implemented : 633.521, 633.524, 633.534 F.S.

History : New 10-14-86, Amended 12-21-88, 10-20-93

4A-46.015 Testing.

- (1) An applicant who has been qualified to challenge an examination will be notified in writing of available examination dates at a division district office. Upon receipt of a written request for a specific examination date, the applicant will be sent a notice of the exam date, time and location at least seven days prior to the scheduled exam. The applicant will be expected to challenge the exam on that day unless he submits a written waiver of his right to challenge the exam on that day and requests a later date. The Regulatory License and Statistics Section will schedule an applicant for a later day upon receipt of a written request. The applicant will also be permitted to challenge the examination at the Regulatory Licensing and Statistics Section's office in Tallahassee if the applicant makes a request for such testing in writing and receives written notification when the next available scheduled examination will be held in Tallahassee.
- (2) The examinations are multiple choice and open book. The examinations are based on relevant Florida and federal laws pertaining to the construction industry, safety standards, administrative procedures, pertinent technical data, and on standards of the National Fire Protection Association (NFPA). An applicant shall be notified of the study material required for the contractor class for which he has applied.
- (3) Each applicant must provide his or her own NFPA standards and other resource materials for use during the exam. Applicants will not be allowed to share standards or materials during an examination.
- (4) NFPA standards may be obtained from the National Fire Protection Association, Batter Park, Quincy, Massachusetts 02215. Sources for other materials will be listed on the information sheet supplied to each applicant before the examination.
- (5) The applicant must bring positive identification, including identification containing the applicant's photograph, to the exam.
- (6) Examination grades and papers are confidential. Applicants will be notified of examination scores in writing only.
- (7) Reexaminations will be scheduled no sooner than 30 days after any administration of an examination to an applicant. Each examination scheduled requires an examination fee as provided in Section 633.524, Florida Statutes.
- (8) Upon successful completion of a competency examination an applicant must submit evidence of insurance coverage meeting the requirements of Section 633.521, Florida Statutes.
- (9) Upon satisfactory completion of the application, testing and insurance requirements, a certificate will be issued.

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Specific Authority : 633.01, 633.517(1) F.S.

Law Implemented : 633.521 F.S.

History : New 10-14-86, Amended 12-21-88, 8-1-90, 10-20-93, 10-2-96, 6-8-98.

4A-46.016 Insurance Requirements.

- (1) The Fire Protection System Contractor I, II, III, IV, or V licensed pursuant to Section 633.521, Florida Statutes, shall provide evidence of current and subsisting insurance coverage meeting the requirements of Section 633.521, Florida Statutes, to the State Fire Marshal on Form D14A-25, Certificate of Insurance Fire Protection System Contractor, revised and dated 8/93, as adopted and incorporated herein by reference. This form is available from the Regulatory Licensing and Statistics Section, Bureau of Fire Prevention, 200 East Gaines Street, Tallahassee, FL., 32399-0300.
- (2) The licensed Fire Protection System Contractor I, II, III, IV, or V shall be responsible to ensure current and subsisting insurance coverage meeting the requirements of Section 633.521, Florida Statutes, is on file with the State Fire Marshal.
- (3) Failure to provide evidence of insurance coverage within 30 days of the expiration date of the policy or within 30 days of a notice to provide evidence of coverage shall result in administrative proceedings pursuant to Section 633.547, Florida Statutes.

Specific Authority : 633.01, 633.517(1), 633.521(4) F.S.

Law Implemented : 633.521(4) F.S.

History : New 10-20-93

4A-46.017 Required Continuing Education.

- (1) Certificate holders shall complete a continuing education course or combination of courses in compliance with Section 633.537, Florida Statutes, within each license year which begins July 1 and expires June 30.
- (2) The continuing education course or combination of courses shall be in fire protection discipline. This course or combination of courses shall be a total of 24 contact hours in duration.
- (3) The course or combination of courses shall be conducted by persons approved by the Division. Approval of such persons shall be based on the person's training, experience and expertise in fire protection under Florida law.
- (4) Written instructional materials and any audio-visual aids must provide instruction relevant to fire protection under Florida law.
- (5) The course or combination of courses shall be approved by the Division. The Division shall approve any course, seminar, or conference in the technical areas provided by any university, community college, vocational-technical center, public or private school, firm, association, person, corporation or entity which meets the criteria provided in this rule.
- (6) Courses shall be submitted for approval for credit toward the continuing education requirement.

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- (a) Requests for approval shall be submitted on Form D14-1239 (6/97), "Request for Approval of Fire Protection System Contractor Continuing Education Coursework" as adopted and incorporated herein by reference.
 - (b) Forms are available from and submissions shall be sent to: Regulatory Licensing and Statistics Section, 200 East Gaines Street, Tallahassee, Florida, 32399-0342.
 - (c) Each certificate holder shall be notified by the Regulatory Licensing and Statistics Section, in writing if the coursework does not satisfy the continuing education requirement in Section 633.537, Florida Statutes. No notification will be given over the telephone.
 - (d) The application shall include:
 - 1. the total number of classroom hours,
 - 2. the course outline of the contents of the course,
 - 3. the name and qualification of instructors,
 - 4. a written description of any audio-visual aids,and
 - 5. a copy of any instructional materials or handouts must be attached.
 - (e) The number of classroom hours must be devoted to course content and does not include registration periods, meals, and keynote speakers or similar nonsubstantive time periods.
 - (f) Examples of courses which will be approved if the criteria and procedures of this rule are met:
 - 1. Florida Fire Sprinkler Association meetings;
 - 2. American Fire Sprinkler Association meetings;
 - 3. NFPA meetings and seminars; and
 - 4. training sessions conducted by manufacturers.
 - (g) The division shall approve continuing education courses which relate to the technical fire protection skills of certificate holders which contain educational content to improve the quality of a contractor's fire protection performance.
 - (h) At the conclusion of each approved course, the organization or person offering the course shall inform the Division that the course was completed and shall supply the Division with sign-in sheet or roster. The sign-in sheet or roster shall require every person to print their name, list their contractor's certificate number and sign their name.
 - (I) Each person who completes an approved course shall be issued a certificate of completion. The certificate of completion shall contain the name and license number of the person who completed the course. The certificate shall include the name of the course and the course number assigned by the division.
- (7) Each certificate holder is responsible for attending the appropriate course or courses and for maintaining proof of completion of the course or courses. Such proof shall be in the form of copies of certificates of completion awarded. The Regulatory Licensing and Statistics Section will not accept any proof of completion except that submitted in accordance with subsection (8) below.

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- (8) Prior to the annual expiration of the Certificate of Competency, the certificate holder shall submit proof of completion of the required course or courses to the Regulatory Licensing and Statistics Section. Submissions shall be submitted on a “Fire Protection System Contractor Continuing Education Coursework” form, D14-1240 (8/96) as adopted and incorporated herein by reference. Forms are available from and submissions shall be sent to: Regulatory Licensing and Statistics Section, 200 East Gaines Street, Tallahassee, Florida, 32399-0342. Each certificate holder will be notified by the Regulatory Licensing and Statistics Section, in writing, if the coursework does not satisfy the continuing education requirement in Section 633.537, Florida Statutes. No notification will be given over the telephone.
- (9) Any Fire Protection System Contractor who does not complete the continuing education requirement shall not have his or her certificate renewed. If the certificate holder is not renewed, the certificate holder shall perform no work for which a license is required. A certificate holder wishing to become licensed again shall meet the requirements of Section 633.521, Florida Statutes.

Specific Authority : 633.01, 633.517(1) F.S.

Law Implemented : 633.521, 633.537 F.S.

History : New 10-2-96, Amended 6-18-97,6-8-98.

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FIRE PROTECTION CONTRACTORS AND SYSTEMS
PART II GENERAL PROVISIONS

PART II GENERAL PROVISIONS

4A-46.025 Scope.

The provisions of this part shall apply to the lay out, fabrication, installation, inspection, alteration, repair, or servicing on the fire protection systems.

Specific Authority : 633.01 F.S.

Law Implemented : 633.021(2), (3), (4), (5), (7), (20), 633.082, 633.541, 633.547,633.551, 633.554 F.S.

History : New 12-21-88.

4A-46.030 Definitions.

- (1) For purposes of this part, the definitions in Rule 4A-46.005 shall have the same meaning as in Part I.
- (2) In addition, the following term shall have the following meaning: "Registered professional engineer" shall mean an individual who is registered to engage in the practice of engineering as prescribed in Chapter 471, Florida Statutes.

Specific Authority : 633.01 F.S.

Law Implemented : 633.021 F.S.

History : New 12-21-88, Amended 8-1-90.

4A-46.035 Standards of the National Fire Protection Association to be Complied With.

- (1) The following standards of the National Fire Protection Association which are hereby adopted and incorporated herein by reference shall be complied with by all those holding certificates of competency as fire protection system contractors pursuant to the provisions of Chapter 633, Florida Statutes:
 - (a) NFPA 11, 1994 Edition, Standard for Low Expansion Foam and Combined Agent Systems.
 - (b) NFPA 11A, 1994 Edition, Standard for Medium and High Expansion Foam Systems.
 - (c) NFPA 12, 1993 Edition, Standard on Carbon Dioxide Extinguishing Systems.
 - (d) NFPA 12A, 1992 Edition, Standard on Halon 1301 Fire Extinguishing Systems.
 - (e) NFPA 12B, 1990 Edition, Standard on Halon 1211 Fire Extinguishing Systems.
 - (f) NFPA 13, 1994 Edition, Standard for the Installation of Sprinkler Systems.
 - (g) NFPA 13D, 1991 Edition, Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes.
 - (h) NFPA 14, 1996 Edition, Standard for the Installation of Standpipe and Hose Systems.
 - (i) NFPA 15, 1990 Edition, Standard for Water Spray Fixed Systems for Fire Protection.
 - (j) NFPA 16, 1995 Edition, Standard for the Installation for Deluge Foam-Water Sprinkler Systems and Foam-Water Spray Systems.
 - (k) NFPA 17, 1994 Edition, Standard for Dry Chemical Extinguishing Systems.
 - (l) NFPA 17A, 1994 Edition, Standard on Wet Chemical Extinguishing Systems.
 - (m)NFPA 20, 1993 Edition, Standard for the Installation of Centrifugal Fire Pumps.

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- (n) NFPA 22, 1996 Edition, Standard for Water Tanks for Private Fire Protection.
- (o) NFPA 24, 1995 Edition, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.
- (p) NFPA 72, 1993 Edition, Standard for the Installation, Maintenance, and Use of Protective Signaling Systems.
- (q) NFPA 96, 1994 Edition, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- (r) NFPA 214, 1992 Edition, Standard for Water Cooling Towers.
- (s) NFPA 231, 1995 Edition, Standard for General Storage Indoor.
- (t) NFPA 231C, 1995 Edition, Standard for Rack Storage of Materials.
- (u) NFPA 231D, 1994 Edition, Standard for Storage of Rubber Tires.
- (v) NFPA 232, 1995 Edition, Standard for Record Protection.
- (w) NFPA 409, 1995 Edition, Standard for Protection of Aircraft Hangars.
- (x) NFPA 13R, 1994 Edition, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to Four Stories in Height.
- (y) NFPA 25, 1995 Edition, Water-based Fire Protection Systems.
- (z) NFPA 2001, 1996 Edition, Standard on Clean Agent Fire Extinguishing System.

Specific Authority : 633.01 F.S.

Law Implemented : 633.01, 633.051, 633.065, 633.082 F.S.

History : New 12-21-88 Amended 7-19-89, Amended 8-1-90, 10-2-93, 10-2-96, 6-8-98.

4A-46.040 Installation Requirements for Automatic Sprinkler Systems Employing Water as the Extinguishing Agent.

- (1) Fire protection system contractors installing an automatic sprinkler system employing water as the existing agent shall supervise and be responsible for the complete system, except that a Contractor installing the underground pipe shall supervise and be responsible only for the portion he installs and the Contractor installing the remaining portion of the system shall be responsible only for his portion of the work.

The contractor shall be responsible to install the complete system in compliance with the National Fire Protection Association standards adopted pursuant to Rule 4A-46.035, except that if a contractor installs the underground pipe he shall be responsible for that portion of the system, and the Contractor installing the remaining portion shall be responsible for the system from the point of connection to the underground throughout the remainder of the system.

- (2) The complete system begins at the point-of-service as defined in Section 633.021(16), Florida Statutes, and ends at the most remote head inside the facility.
- (3) In order to ensure that sufficient water is available at the point-of-service to provide the water inside the facility as required by the plans, the contractor who installs the underground portion shall be responsible for conducting the acceptance tests required by Section 1-11, NFPA 13 and shall personally, sign and maintain on file the Contractor's Material and Test Certificate for Underground Piping as specified in NFPA 13, as adopted in Rule 4A-46.035.

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- (a) If the above ground pipe is installed by a contractor other than the one who installed the underground, the contractor shall be responsible to obtain a copy of the underground certificate from the underground contractor and maintain it on file before connection to the underground is made. If the contractor is unable to obtain the certificate, he shall notify the State Fire Marshal.
- (4) Upon completion of the final installation of the above ground piping, the contractor shall conduct the tests and sign and maintain on file the Contractor's Material and Test Certificate for Above ground Piping as specified in NFPA 13, as adopted in Rule 4A-46.035.
- (5) Failure to complete and maintain the two certificates described in subsections (3) and (4) above shall be grounds for disciplinary action as violations of Section 633.539, Florida Statutes.
- (6) The contractor whose name appears on the application for the building permit shall be responsible for the acceptance tests which are required in NFPA 13, Section 1-11. The contractor shall complete all portions of the Contractor's Material and Test Certificate(s) that are related to the system being tested. The contractor shall sign and date the test certificates. In cases where there may not be a building permit, the contractor that supervised the installation shall be responsible for the performance of these duties.
- (7) The contractor shall maintain on file all Contractor's Material and Test Certificates, and shall provide such to the State Fire Marshal upon his request.
- (8) The contractor shall complete and attach to the system a tag as described in 4A-46.041.

Specific Authority : 633.01 F.S.

Law Implemented : 471.025, 553.79(6), 633.065, 633.539, 633.547(2)(e) F.S.

History : New 12-21-88, Amended 8-1-90, 10-20-93.

4A-46.041 Inspection, Testing and Maintenance Requirements for Fire Protection Systems.

The contractor shall submit in writing to the State Fire Marshal the names and addresses of all individuals in his employ that are performing inspections of fire protection systems. The contractor shall not allow any individual to perform inspections under his certificate until that individual has been listed with the State Fire Marshal. The contractor shall be responsible for each listed individual's inspections until he has requested in writing that the State Fire Marshal delete the individual from his list of inspectors.

- (1) A Fire Protection Contractor, contracting to perform inspecting, testing, and maintenance service on a fire protection system shall comply with the requirements of the applicable NFPA standard as adopted in 4A-46.035.
- (2) Each system that has been inspected, tested, or maintained by a fire protection contractor, or his designated inspector, shall have a record tag placed on the riser or control device.

APPENDIX H DOCUMENT REVISION HISTORY

- November 2017, Revision 3
 - Complete update based on August 2017 ordinance and change in procedures related to ownership, testing, repair and installation including Orange County Responsibilities
 - Change to allow Dual Check as the preferred device in reclaimed service areas.
 - Update to be inclusive of FDEP rule changes from 2010
- January 2009 Revision 2
- Cover page Revision 2, 2008
- Updated Preface text, page ii, changed title Preface to Introduction & Procedures Statement, enforcement
- Updated Purpose, page iii includes section of AWWA M-14
- Updated M-14 reference 2004, page iii
- Updated page v. Backflow Tester
- Updated page v. Record keeping, Educational materials
- Update Table of Contents, pages 97-100, vii
- Updated page 8, Table 2-1, Plumbing code guides
- Updated page 9, Table 2-2, at water meter protection
- Updated page 10, expanded text Thermal Expansion
- Updated page 11,
- Updated page 27, first paragraph, Orange County Utilities development engineering, enforcement site plans and plumbing codes
- Updated pages 29- 30, Emergency Response Procedure
- Updated page 31, Inspections shall be performed in compliance with (FDEP rule: 62-610.469) and The Orange County Reclaimed Water Ordinance (Ord No. 94-21-sec:37-662) Emergency Procedures for Suspected Cross Connections. In the event that Orange County Utilities is informed of or suspects a potential cross connection to the potable water system, the following procedures shall be followed.
- Updated page 32, removed air-gap, protection recommended, auxiliary water supplies
- Updated page 34, removed air-gap, protection recommended
- Updated page 35, removed air-gap, protection recommended
- Updated page 36, removed air-gap, protection recommended
- Updated page 40, removed air-gap, protection recommended
- Updated page 43, removed air-gap, protection recommended
- Updated page 44, removed air-gap, protection recommended
- Updated page 46, removed air-gap, protection recommended
- Updated pages 49-53, expanded recommendation fire protection, and utilities responsibility
- Updated page 56, removed air-gap fire system protection
- Updated page, 56-57, testing upon installation or repair, directed by Orange County Utilities
- Updated page, 57, Removed text, tests before initiation of this manual
- Updated page 57, Testing procedures should be followed, removed test before backflow assembly warranties expiration dates
- Updated page 62 phone & fax numbers, Appendix B
- Updated Appendix D, Gray water system, color coding

- Updated pages 70-71, added gray water system color coding, Florida Building Code/Plumbing with 2007 standards
- Updated pages 92-94, Testing procedures, using Mid-West test kit 830
- Updated pages 95, added text, Inspection to all potable water connections
- Updated pages 95, added text Surveys and Retrofitting, Record keeping, and Education
- Added page 97, Approving Backflow Tester registration
- Updated page 98,99 Appendix M revisions

September 2002 Revision 1

- Manual Cover, changed photo, removed policy from title and added revision date.
- Manual Cover date change from April 2001 to January 2005 and cover page picture change.
- Page 9, Hydrant Meter Connection DCVA to RPBA.
- Page 26, Dual Check wording.
- Page 69, Appendix E, Replaced old Orange County Plumbing Code with Florida Building Code/Plumbing, Selected Portions.
- Page 91, removed old Appendix J Health Programs 10D-9, not applicable, changed to test procedures.
- Page 95, added new Appendix K, Fire Hydrant and Backflow Protection.
- Page 96, added new Appendix L, Revisions to Manual Section.