CROSS-CONNECTION CONTROL PLAN

Village of Tequesta

Updated May 2021

https://www.tequesta.org/116/Water-Utilities

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INTRODUCTION

The Village of Tequesta maintains an active Cross-Connection Control Program in accordance with state statutes to protect the potable water supply from contaminants and pollutants at the point of connection and to ensure that proper backflow prevention devices are installed where hazards exist. This program is comprehensive and applies to all customers connected to the potable water system.

The Village Cross-Connection Control (CCC) Program contains the five elements required by Florida Administrative Code (FAC) 62-555.360. They include:

1. Legal authority for the CCC program
2. Policies establishing where backflow protection at service connections is mandatory
3. Policies regarding ownership, installation, inspection/testing & maintenance of backflow protection devices
4. Procedures for evaluating customer's premises to establish a category of customer and the backflow protection method that is required
5. Procedures for maintaining CCC program records

The CCC program is authorized by Section 50-186 of the Village Code and specific requirements for implementing these program elements are included in this manual, the Village of Tequesta Utilities Department Manual of Standards, and the most current edition of the Florida Building Code – Plumbing (FBC-C). The policies or procedures of the CCC program are uniformly implemented by the Village of Tequesta Utilities Department with support from the Village of Tequesta Building Department or other applicable building department. Questions regarding CCC program policies or procedures should be directed to the Village of Tequesta Utilities Department at (561) 768-0421 between the hours of 8:30 a.m. to 5:00 p.m.

Questions related to the FBP-C, should be directed to the Village of Tequesta Building Department at (561) 768-0450.

Copies of this policy may be obtained from Village of Tequesta web site at: https://www.tequesta.org/116/Water-Utilities.

Failure to comply with these requirements may result in penalties, suspension of water service until the situation is resolved and/or issuance of a Notice of Violation (NOV) by the Village of Tequesta Building Department or other applicable building department.

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.

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.

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.

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 tester - A person who 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 and Fire Sprinkler Cross-Connection control tester are documented in ASSE standard 5110 & ASSE 5140.

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

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

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.

Cross connection – Any unapproved or unprotected actual or potential connection or structural arrangement that is made between any part of the potable 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, and the Village of Tequesta 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 - Water distribution piping connected, without an air gap, to an "end-use" where a potential source of contamination exists.

Double check valve assembly (DCVA) - An assembly composed of two independently acting, approved check valves, in 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.

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.

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.

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 distribution system - All pipes, fittings, and fixtures used to convey potable water from one point to another.

Potable water service - The provision of potable water from the Village 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, non-potable, 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.

Service connection - A piping connection between the Village of Tequesta potable water 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
FAC	Florida Administrative Code
FBC-P	Florida Building Code - Plumbing
FDEP	Florida Department of Environmental Protection
FS	Florida Statutes
HRS	Florida Department of Health and Rehabilitative Services
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NOV	Notice of Violation
OSHA	United States Department of Occupation Safety and Health Administration
RPBA	Reduced Pressure Backflow Assembly

PURPOSE & LEGAL AUTHORITY

The Village of Tequesta protects public health through the enforcement of requirements and standards for design, construction, operation and maintenance of the public potable water supply systems. Cross connection as defined in Rule 62-550.200 Florida Administrative Code (FAC) 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 FAC; 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 FBC-C.

State law requires that the Village of Tequesta 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 potable 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 potable water system. Rules concerning reclaimed water and its use are found in Chapter 62-610 of the F.A.C.

The Village of Tequesta Council CCC Program and this plan are authorized via Section 50-186 of the Village Code of Ordinances.

The Village of Tequesta Utilities Department and Building Department will ensure that the guidelines and procedures in this Manual are uniformly implemented.

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 potable water system.

A cross connection is any physical arrangement whereby a potable 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 source 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 potable 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.

BACKFLOW CONTROL

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 Village of Tequesta Utilities Department and Village of Tequesta Building Department, through onsite inspections of new and existing water services, will determine the applicable controls based upon applicable statutory provisions, FBC-P, requirements of this manual, and the Village of Tequesta Utilities Department Manual of Standards.

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: 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: 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 Village of Tequesta Utilities Department).
- All potable water commercial services
- Where 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)

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 (Reduced Pressure Backflow Prevention Assembly 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: 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).

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 the Village of Tequesta Utilities Department and on the assessment of the probability of the air gap being bypassed.

Reduced Pressure Backflow Prevention Assembly (RPBA)

Description: 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: AWWA Standard C511-17 and ASSE Standard 1013

Function: 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 of water out of the relief valve if failure of the assembly or system occurs.

Application: 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. RPBAs are the predominant method of backflow prevention used for most high hazard locations and in all commercial connections.

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

Description: 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 - AWWA Standard C510 and CSA B64.5
DCDA - AWWA Standard C510, ASSE Standard 1048 and CSA B64.5

Application: 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. A DCDA shall be used on dedicated fire lines, supplying water exclusively for fire protection systems without metering.

Pressure Vacuum Breaker (PVB)

Description: 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: ASSE Standard 1020, CSA B64.1.2 and standards of USC FCCC & HR.

Function: 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: 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.

Dual Check Backflow Device (DuC):

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

Approved Standards: ASSE Standard 1024 and CSA B64.6

Function: In a backpressure condition, the increase 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: Residential service areas with reclaimed water (low hazard). **Dual Check valves are not testable and must be replaced every seven (7) years.** Dual Check valves must be installed immediately after the meter box.

Hose Connection Vacuum Breakers (HCVB):
Hose Connection Vacuum Breakers shall conform to ASSE standard 1011. Installation enforcement is through Village of Tequesta Building Department of other applicable building department in accordance with the FBC-P.

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 the FBC-P. A temperature and pressure relief valve (T and P valve) on the water heating unit or boiler is also required by the FBC-P.

BACKFLOW PREVENTION REQUIREMENTS

BACKFLOW PROTECTION LOCATIONS

The Village of Tequesta Utilities Department and Building Department reviews new building permits 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, the Utilities Department and Building Department, through on-site inspections of new and existing water services, enforces state and local rules, these policies, the FBC-P, 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 Utilities Department and Building Department. 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. Failure to install a required backflow preventer shall be grounds for penalties, service disconnection or termination and the issuance of a NOV by the Village of Tequesta Building Department or applicable building department.

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 the Village of Tequesta's potable water system must be lead free in accordance with Safe Drinking Water Act.

For properties with auxiliary water supplies, including a well with a pump used for irrigation, 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 table below:

Minimum Backflow Protection by Customer Category (Table 62-555.360-2, FAC)	
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]	A. At or for a residential service connection[6]: DuC[7]
	B. At or for a non-residential service connection[6]: 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]
Premises where there is a cooling tower	RP
Premises where there is an irrigation system that is using potable water and that: I. Is connected directly to the CWS's distribution system via a dedicated irrigation service connection	I. At or for a residential or non-residential dedicated irrigation service connection[6]: PVB if backpressure cannot develop in the downstream piping[10]; or RP if backpressure could develop in the downstream piping[10]
II. Is connected internally to the customer's plumbing system	II. None[11]
Premises where there is a wet-pipe sprinkler, or wet standpipe, fire protection system that is using potable water and that: I. Is connected directly to the CWS's distribution system via a dedicated fire service connection[12]	I.A. At or for a residential dedicated fire service connection[6]: DuC if the fire protection system contains no chemical additives and is not connected to an auxiliary water system[4]; or RP or RPDA if the fire protection system contains chemical additives or is connected to an auxiliary water system[4,13]
II. Is connected internally to the customer's plumbing system	I.B. At or for a non-residential dedicated fire service connection[6]: DC or DCDA if the fire protection system contains no chemical additives and is not connected to an auxiliary water system[4]; or RP or RPDA if the fire protection system contains chemical additives or is connected to an auxiliary water system[4,13]
	II. None[11]
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	DC if the customer has no potable

ground level	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), 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), 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 FDEP 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 auxiliary water system on the customer's premises, the cross-connection shall be eliminated or the backflow protection provided at or for the service connection must be 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 storm water 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 cross-connection shall be 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 - Plumbing. 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 FDEP 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.

BACKFLOW PREVENTOR OWNERSHIP

The customer shall own, and shall be responsible for installation, inspection/testing, and maintenance of, any backflow protection required at or for a service connection from the CWS.

INSTALLATION, TESTING & MAINTENANCE

INSTALLATION

All backflow prevention assemblies shall be installed in accordance with the manufacturer's installation instructions and in accordance with the Village Utility Policies and Procedures and a plumbing permit must be obtained in advance from the Village of Tequesta Building Department or applicable building department.

Time Limit

The consumer shall, upon notification, install the appropriate backflow prevention assembly within the following time frame:

High hazard Facilities	15 days
Low hazard Facilities	30 days

Installer

All backflow prevention assemblies shall be installed by a certified backflow preventer tester/repairer. The certified backflow preventer tester/repairer is responsible to make sure the assembly is working properly when it is installed, and to make available all installation and testing information for approval by the Director or designee.

TESTING

Non-Residential

Testing of backflow preventers is required annually for all non-residential connections to the water system. The testing is the responsibility of the property owner and the results of testing shall be reported to the Village of Tequesta Utilities Department 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 submitted with the test results. Failure to provide these results can result in discontinuance of water service. Any backflow preventer failing a test must be repaired or replaced and retested within 30 days of failing the test. If it is replaced the type, make, model and location of the backflow preventer shall be reported to the Village of Tequesta Utilities Department and a plumbing permit must be obtained in advance from the Village of Tequesta Building Department or applicable building department. The results of testing shall be reported on the Backflow Preventer Field Test Report (Appendix A).

Residential

Testing of backflow preventers is required biannually for all residential connections to the water system. The testing is the responsibility of the property owner and the results of testing shall be reported to the Village of Tequesta Utilities Department 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 submitted with the test results. Failure to provide these results can result in discontinuance of water service. Any backflow preventer failing a test must be repaired or replaced and retested within 30 days of failing the test. If it is replaced the type, make, model and location of the backflow preventer shall be reported to the Village of Tequesta Utilities Department and a plumbing permit must be obtained in advance from the Village of Tequesta Building Department or applicable building department. The results of testing shall be reported on the Backflow Preventer Field Test Report (Appendix A).

In order to be accepted the following information must be submitted to the Village of Tequesta Utilities Department confirming each successful test result:

1. Fully completed and signed Backflow Preventer Field Test Report
2. Copy of State or County Plumbing license
3. Copy of Backflow Prevention Assembly Tester Certification
4. Copy of state fire sprinkler Contractor I or Contractor II certification (if applicable)
5. Copy of Business Tax Receipt for local authority
6. Annual Testing Kit Calibration Report/Certification for the test kit used during testing

Any service with a backflow device not tested within the required intervals shall be subject to penalties, suspension of water service until the situation is resolved and/or issuance of a Notice of Violation (NOV) by the Village of Tequesta Building Department or other applicable building

Tester Requirements:

All persons engaged in testing backflow preventers within the Village of Tequesta Utility Service Area under this program shall meet the following requirements:

- Certified backflow tester
- State fire sprinkler Contractor I or Contractor II license (fire all fire lines)

Any person testing a backflow prevention assembly within the Village of Tequesta Utility Service Area must be a certified backflow preventer/repairer. Any person testing or repairing a backflow assembly on a fire protection system, within the Village of Tequesta Utility Service Area, must be a state licensed fire sprinkler contractor.

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 shall be differential models listed by FCCC & HR-USC of acceptable gauges, sight tube method, Duke digital, or other approved test equipment sold by backflow assembly manufactures. The test kit gauges shall be calibrated once per year.

REPAIR & REPLACEMENT

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

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 the Village of Tequesta Utilities Department and documented on the Backflow Preventer Field Test Report (Appendix A).

NEW & EXISTING SERVICE CONNECTIONS

NEW SERVICE CONNECTIONS

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 Village of Tequesta 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 to the Village of Tequesta Utilities Customer Service department. The request for inspection should be made, by the customer, once the irrigation system is installed and prior to removing the lock from the reclaimed water meter.

Commercial or Industrial:

On any new commercial or industrial construction plans, the Village of Tequesta Utilities Department will review projects when submitted to the applicable building departments (Village of Tequesta, Palm Beach County or Martin County). 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. The Village of Tequesta 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 SERVICE CONNECTIONS

The Village will evaluate the customer's premises at an existing—i.e., previously constructed—service connection whenever any of the following events occur:

- Whenever the customer connects to a reclaimed water distribution system. The Village will coordinate with the reclaimed water supplier to ensure that reclaimed water service is not turned on until appropriate backflow protection is provided at the potable water service connection.
- 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.

- Whenever the customer's premises are altered under a building permit in a manner that could change the backflow protection required at or for a service connection to the customer.

RECORD KEEPING

The Village of Tequesta 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.

The Village of Tequesta will keep the latest assessment questionnaire or risk assessment survey record of each service connection until the next assessment is made. These assessment questionnaires or risk assessment survey records may be paper and or electronic format. The Village of Tequesta 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 be 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 seven 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

INVESTIGATING & RESPONDING TO BACKFLOW INCIDENTS

Any person knowing or suspecting a cross connection incident shall immediately notify the Village of Tequesta Utilities Department at (561) 768-0421 to start the incident response procedures.

In the event that the Utilities Department 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 first notified of a backflow incident or event, the Distribution Superintendent or their designee will 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 may include temporarily installing a backflow assembly at the water meter connection until the backflow hazard has been eliminated or discontinuing water service to premises where a hazardous condition exists.

- If the water service is temporarily locked off, the Distribution Superintendent or their designee will notify Utilities Customer Service. 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 a door hanger will be left at the site explaining the incident and include the name and phone number of a Utilities 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 Distribution Superintendent or their designee shall notify the local plumbing officials as necessary for violations or corrective action. The Utilities Director 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 Utilities Department 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 the Utilities Department as described in the "Record Keeping" section.

- Backflow incident reports 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 Palm Beach County Department of Health 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 B):

  - 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

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. Village of Tequesta Ordinance No. 411 as Exhibit A.
4. Village of Tequesta Code: Chapter 50. Natural Resource Protection. Article VI. - Water Protection and Conservation Sec.50-186 Cross connection and backflow prevention 8-8-2013.

APPENDICIES