Exhibit “A”

Cross-Connection Control Manual

February 2021

PREFACE

This manual including Appendices A and B is a manual of policies and specifications for a Cross-Connection Control program adopted by the Board of Supervisors of Tohopekaliga Water Authority.

This manual of policies and specifications is adopted by TWA Resolution No. 2018-003 and serves as a guide to ensure that safe potable water is maintained.

Tohopekaliga Water Authority:

1. Urges the reading of this manual of policies and specifications before designing or installing a backflow prevention device assembly to ensure the safety of drinking water.
2. Believes the material in this manual will provide the consumer with the understanding of cross-connections and backflow assemblies.
3. Will ensure that the policies, standards and specifications as set forth in this manual will be uniformly administered and enforced.

If there are any questions regarding this manual or policies, please call TWA at (407)944-5000 and ask for the Field Services Department.

Introduction

Tohopekaliga Water Authority (TWA) has had a Cross-Connection Control program for many years. The purpose of the program is to protect the potable water supply from contamination resulting from backpressure and backsiphonage. This Manual is intended to supersede and replace the Cross-Connection Control Plan adopted by the TWA Board of Supervisors in 2011. This program applies to residential and commercial customers. TWA's Cross-Connection Control program adheres to the following requirements established by state regulation (Rule 62-555.360, Florida Administrative Code):

1. Legal authority for the Cross-Connection Control program.
2. Policy establishing the appropriate level of backflow protection at the service connection for the appropriate category of customer.
3. Policies regarding responsibility for installation, inspection/testing and maintenance of backflow preventers at the service connection.
4. Procedures for assessing new or existing service connections to determine the need for backflow prevention at the service connection.
5. Procedures for record keeping.
6. Procedures for educating the public about cross-connections and backflow prevention.
7. Procedures for investigating and responding to cross-connection and backflow incidents.

This Cross-Connection Control Manual was adopted on June 13, 2018, by Resolution No. 2018-003 of the TWA Board of Supervisors. Additional information regarding these policies or procedures may be obtained by contacting the TWA Cross-Connection Control program at (407) 944-5000 or BackflowCompliance@tohowater.com.

Table of Contents

SECTION 1: Purpose and Legal Authority

PURPOSE:

The purpose of TWA's Cross-Connection Control program is to protect the public water system from contamination or pollution. This manual and program are designed to inform TWA's customers (residential and commercial) and contractors of the requirements for backflow protection.

The program promotes the elimination of existing cross-connections, actual or potential.

The State of Florida requires Community Water System (CWS) purveyors to implement a cross-connection program and manual.

LEGAL AUTHORITY:

TWA's Cross-Connection program is established through the provisions of the Florida Safe Drinking Water Act (F.S. sec 403.850-403.885). 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 edition of the Florida Building Code.

State law requires that all public water suppliers must protect against backflow by complying with the recommendations in the American Water Works Association (AWWA) M14 manual. Water suppliers that have service areas served by reclaimed water under Part III of Chapter 62-610, F.A.C., are required to maintain a cross-connection control program.

SECTION 2: Definitions

DEFINITIONS:

1. Air-Gap Separation
   The unobstructed vertical distance through free atmosphere between the lowest effective 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 and physical separations must be at least twice the effective opening of the water supply outlet, but never less than 1 in. (25mm) above the receiving vessel flood rim.

2. Approved
   Accepted by the authority having jurisdiction as meeting an applicable standard, specification or requirement as suitable for the proposed use.

3. Approved Check Valve
   Check valve that is drip-tight in the normal direction of flow when the inlet pressure is at least one psi and the outlet pressure is zero. The check valve shall permit no leakage in a direction reverse to the normal flow. The closure element (e.g., clapper, poppet, or other design) shall be internally loaded to promote rapid and positive closure.

4. Assembly
   A backflow prevention device equipped with approved shut-off valves and testable in-line.

5. 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.

6. 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 Tohopekaliga Water Authority does not have sanitary control.

7. Backflow
The reversal of flow of a liquid, gas or other substance in a piping system.

8. Backflow Preventer
An assembly, device or method that prevents backflow.

9. Backpressure
A type of backflow where the pressure is higher than the incoming supply pressure.

10. Backsiphonage
A type of backflow where the upstream pressure in a piping system is reduced to subatmospheric pressure.

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

12. Certified Backflow Prevention Assembly Tester
A person who has demonstrated competence as evidenced by certification that is recognized by the approving authority to field test backflow prevention assemblies.

13. 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.

14. Cross-Connection
An actual connection or a potential connection between any part of a potable water system and any other environment that would allow substances to enter the potable water system. Those substances could include gases, liquids, or solids; such as chemicals, water products, steam, water from other sources (potable or non-potable) or any matter that may change the color or add odor to the water. Bypass arrangements, jumper connections, removable sections, swivel or change-over assemblies or any other temporary or permanent connection arrangement through which backflow may occur are considered to be cross-connections.

15. Cross-Connection Control (CCC)
A program to eliminate cross-connections or to prevent them from causing a public health hazard.

16. Customer
The owner or operator of a private plumbing and/or water system who receives water from TWA.

17. Degree of Hazard (DoH)
The assessment or evaluation of a facilities domestic water system's cross-connections as they relate to the health hazard of the consumers of water.

18. Double Check Detector Backflow Prevention Assembly (DC or DCDA)
A backflow prevention assembly specifically designed with a line-size-approved double check valve assembly with a bypass containing a specific water meter and an approved double check valve assembly. The meter shall register accurately for only very low rates of flow up to 2 gallons per minute (gpm) and shall show a registration for all rates of flow. This assembly shall only be used to protect against a non-health hazard (i.e., a pollutant).

19. Double Check Valve Assembly (DC or DCVA)
A backflow prevention assembly consisting of two internally loaded independently operating check valves, located between two tightly closing resilient-seated shutoff valves with four properly placed resilient-seated test cocks. This assembly shall only be used to protect against a non-health hazard (i.e. a pollutant).

20. Dual Check Backflow Prevention Assembly (DuC)
A backflow prevention 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 and residential domestic service.

21. 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.

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

23. Inspection
A visual examination of a backflow protection device or assembly materials, workmanship or portion thereof to verify installation and operational performance of the device or assembly.

24. Inspector
An individual working for or under the authority having jurisdiction empowered to ensure code compliance.

25. Non-Health Hazard
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. This is also the definition for pollution.

26. 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.

27. Potable Water
Water that is safe for human consumption as described by the public health authority having jurisdiction.

28. Pressure Vacuum Breaker Assembly (PVB)
A backflow prevention 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. This assembly is designed to operate under pressure for prolonged periods of time to prevent backsiphonage. The assembly shall be installed at least twelve inches above the highest outlet. The pressure vacuum breaker may not be subjected to any backpressure.

29. Reclaimed Water
Water that, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is not safe for human consumption.

30. Reduced Pressure Principle Backflow Prevention Assembly (RPBA)
A backflow prevention assembly consisting 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.

31. Service Connection
The connection between the public water system distribution system main and a user's domestic water system.

32. Tohopekaliga Water Authority or TWA
An independent special district established and created pursuant to Chapter 189, Florida Statutes, by special act of the Florida Legislature.

33. Water Purveyor
The owner or operator of public potable water system.

SECTION 3: Responsibility

RESPONSIBILITY:

Classification	Initial Installation/Testing	Ongoing Testing	Maintenance, Repair & Replacement
Commercial	Customer	Customer	Customer
Residential (Includes Irrigation and Customers with Alternative Water Sources)	TWA	TWA	TWA

TWA is responsible for the point of connection to TWA's water supply. For above ground CCC devices, TWA is responsible for maintaining the backflow assembly up to the discharge of the elbow immediately in the ground (from inflow elbow immediately in the ground). For in-ground CCC devices, TWA is responsible for maintaining these devices at the discharge point. If the assembly has been relocated, the property owner will be responsible for the additional piping installed for the purposes of relocating the assembly to a preferential location. Testing, repair and replacement of CCC devices for commercial customers are the sole responsibility of the property owner.

Figure 3.1. Typical RPBA Installation

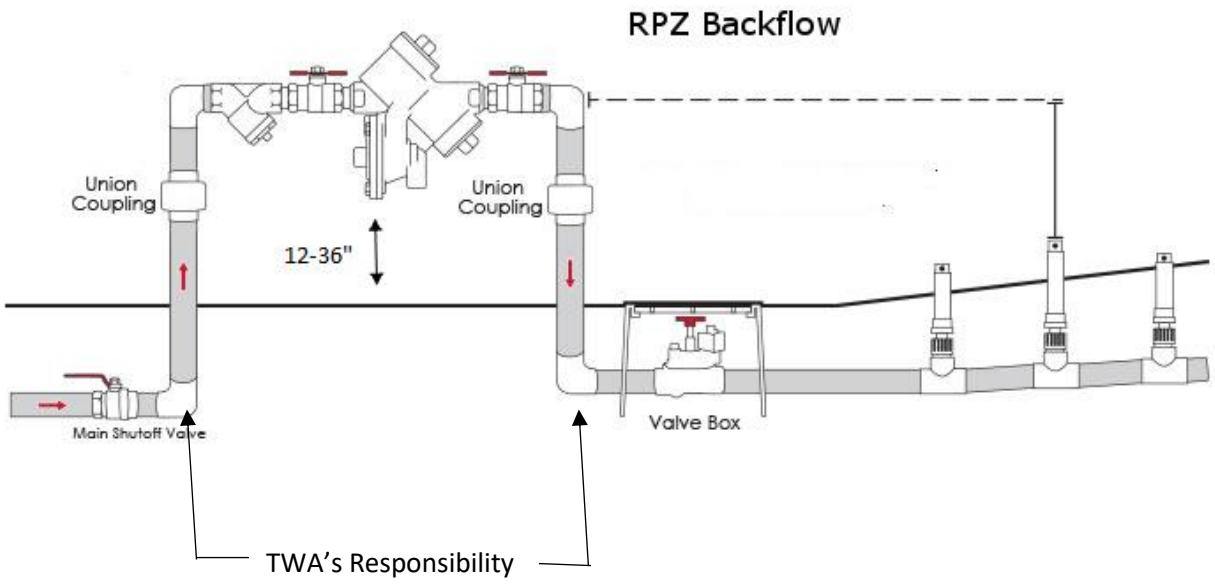


Figure 3.2. Typical PVB Installation

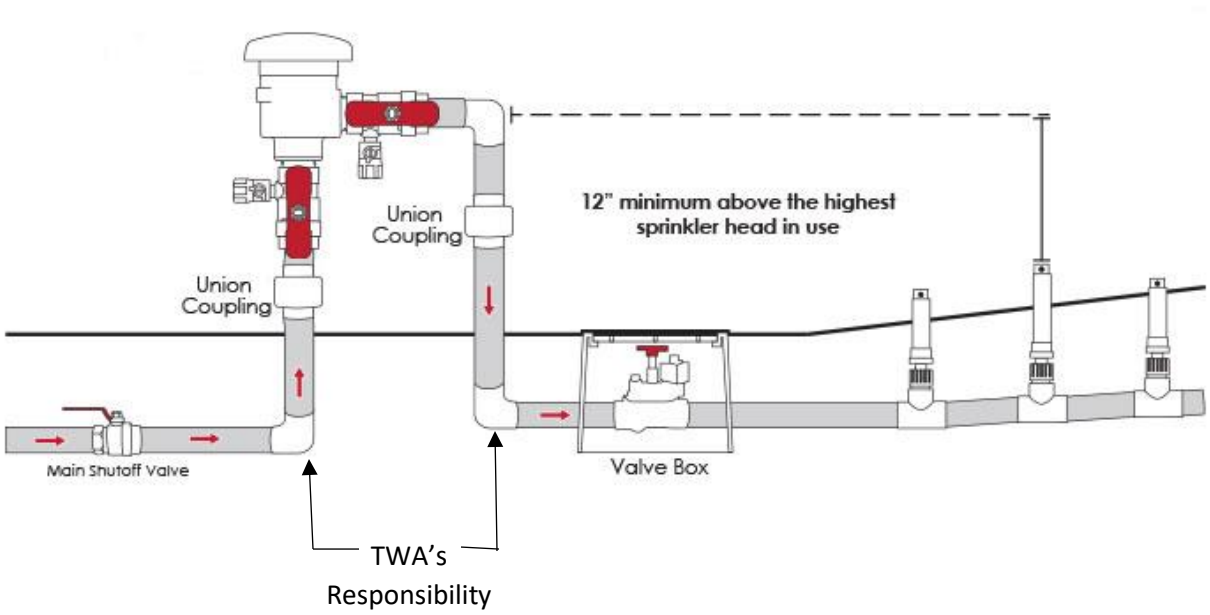
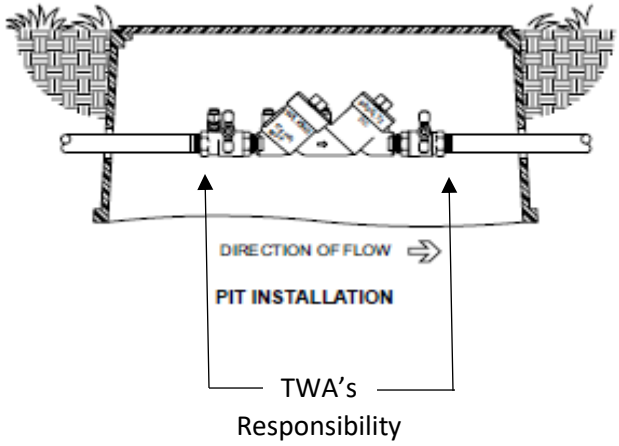


Figure 3.3. Typical DC Installation



SECTION 4: SITE SURVEYS

SITE SURVEYS:

TWA has the responsibility to assess a service location for proper backflow protection based upon the degree of hazard present. This is accomplished via a site survey. Cross-connection surveys are conducted to identify and control cross-connections as part of a multiple barrier approach to protect the drinking water supply. TWA staff or other certified contractor(s) may provide this service. Customers are required to provide access for properly identified TWA staff or contractor(s) during all reasonable hours to perform the survey.

Service locations that receive reclaimed water will be inspected at the time of connection and prior to initial service. Once the proper CCC measure has been installed properly, reclaimed service will be initiated.

In most instances, a site survey is performed on the exterior of a service address. However, due to the various nature of commercial and residential setups, a brief conversation with the customer and an internal survey of the facility may be necessary to properly determine the degree of hazard and the appropriate CCC device. A site survey will contain the following minimum information:

Date
Inspector's Name
Meter(s) Manufacturer
Meter(s) Serial #
Address
GPS Locations of the meter(s)
Customer Contact Information
Business Name
Business Type
Degree of Hazard
Type of CCC Device(s) Present
Recommended CCC Device(s)
Cross-Connection Comments

TWA may also utilize customer questionnaires to assist the physical surveys and to continue to educate its customers on the meaning and importance of backflow and cross-connection control.

SECTION 5: Installation and Maintenance

INSTALLATION:

All backflow prevention assemblies shall be selected in accordance with the University of Southern California's (USC) Foundation for Cross-Connection Control Approved List of Backflow Prevention Assemblies. All backflow prevention assemblies shall be installed in accordance with the manufacturer's installation instructions, American Water Works Association (AWWA) M14 manual and TWA specifications.

Commercial customers are required to install RPBA's at all potable water meters. PVB's may be substituted for irrigation meters. Current Residential backflow requirements are determined via a degree of hazard survey or knowledge of the property (see Backflow Scenarios).

Pipe lines shall be thoroughly flushed to remove foreign material and debris before installing the assembly.

If not already provided, approved shut off valves should be installed at each end of the assembly for testing and servicing purposes (refer to the USC Approved List of Backflow Prevention Assemblies to match the proper shutoff valves with the appropriate backflow device).

The assembly shall be placed in the horizontal position unless otherwise specified by manufacturer's instructions and authorized by TWA.

The assembly shall always be installed in an accessible location to facilitate testing and servicing. Devices shall be clear of vegetation including landscaping.

Unless otherwise approved by TWA, the assembly shall always be installed with the lowest point of the assembly a minimum of 12 inches to 36 inches above the surrounding grade and floodplain for reduced pressure principal assemblies or 12 inches above the highest point of use and any downstream piping supplied from the pressure vacuum breakers. The double check assemblies will be installed in a separate meter box below grade level.

The assembly shall be adequately supported to prevent the assembly from sagging.

For commercial services, all piping and fittings shall be of brass construction. For residential services, all piping and fittings shall be of schedule 80 PVC construction.

The assembly shall meet the standards of the Standard Plumbing Code and AWWA Standards.

Backflow Scenarios

The diagram is provided to give a guidance as to the appropriate level of protection for most scenarios that exist in our service area. This may not represent every scenario encountered by this diagram. Any exceptions will be taken by the Cross-Connection Control Program.

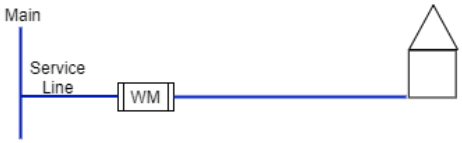
If the residential potable irrigation system was established prior to 05/05/2014, an in-ground double check assembly may be installed. If the potable irrigation system was established after 05/05/2014, an above ground RP assembly must be installed.

Covers or other aesthetic screening are the responsibility of the customer / property owner.

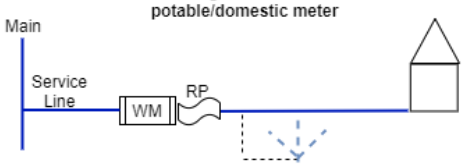
Residential customers may have a private plumber relocate the RP assembly away from the associated meter. This will be at the customer's expense and they will assume the responsibility for the additional footprint of pipe. Toho Water Authority will continue to provide ongoing maintenance of the assembly.

Backflow Scenarios

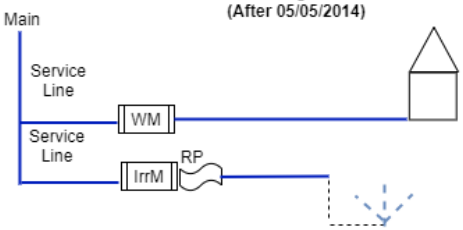
Scenario #1:Dedicated Domestic Meter (For Drinking Water Only)



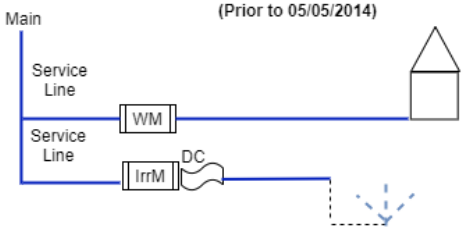
Scenario #2:Potable Irrigation/well/aux H2O teed off of a potable/domestic meter



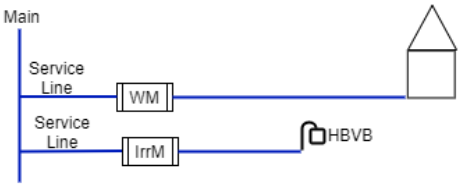
Scenario #3A:Dedicated Potable Irrigation Meter to an irrigation system (After 05/05/2014)



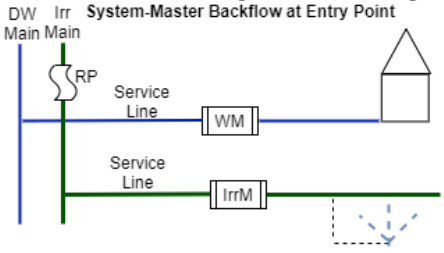
Scenario #3B:Dedicated Potable Irrigation Meter to an irrigation system (Prior to 05/05/2014)



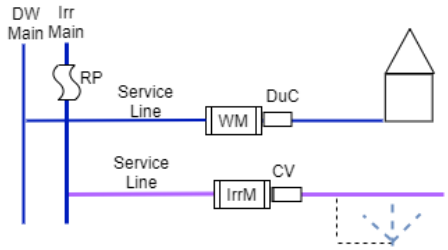
Scenario#4: Dedicated Potable Irrigation Meter to a hose bib



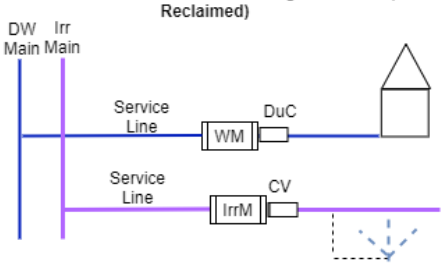
Scenario #5:Dedicated Potable Irrigation Meter to an Irrigation System-Master Backflow at Entry Point



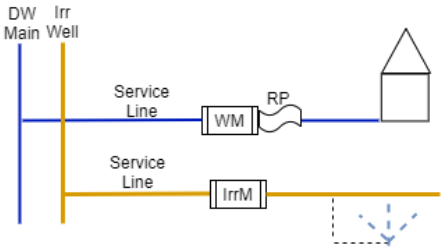
Scenario #6A:Dedicated Reclaimed Irrigation Meter (Jumpered)



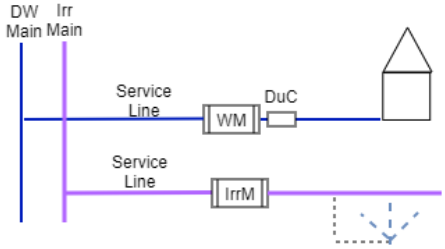
Scenario #6B:Dedicated Reclaimed Irrigation Meter (Real Reclaimed)



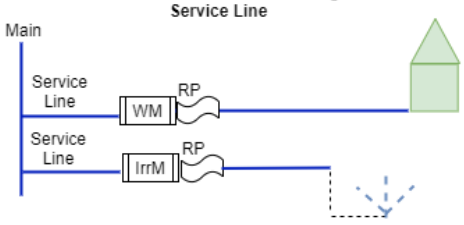
Scenario #7: Irrigation fed by a private well



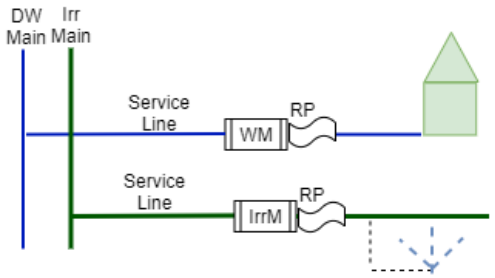
Scenario #8:Private Reclaimed Irrigation Meter (Bellalago, Solivita) Keep RP on Domestic until dies-Replace with DuC



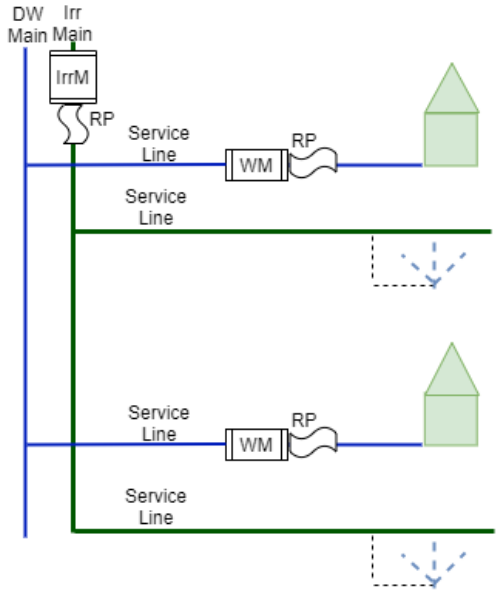
Scenario #9:Commercial Dedicated Potable Irrigation Meter-Same Service Line



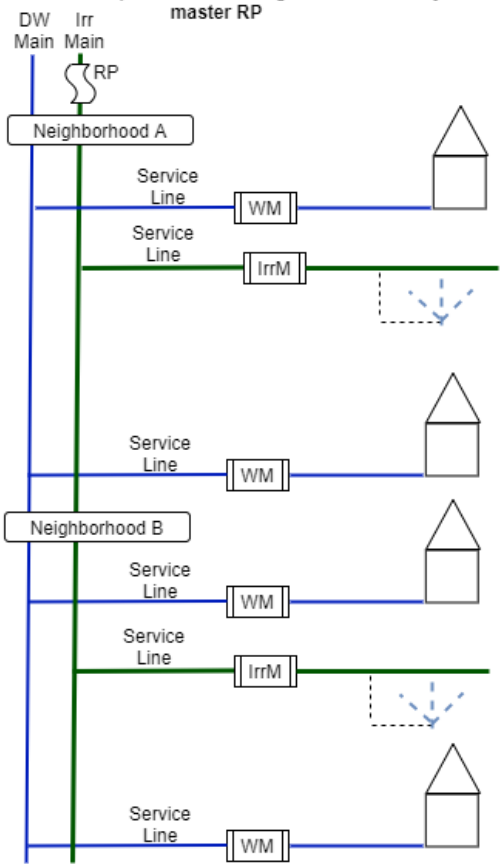
Scenario #10A:Commercial Dedicated Potable Irrigation System-Separate Service Line



Scenario #10B:Commercial Bulk Delivery Potable Irrigation System



Scenario #11: Multiple residential neighborhoods fed by one master RP



Legend
DW Main: Drinking Water Main
Irr Main: Irrigation Water Main
WM: Water Meter
IrrM: Irrigation Meter
DuC: Dual Check Valve
DC: Double Check Valve
CV: Single Check Valve
RP: Reduced Pressure Backflow Prevention Assembly
HBVB: Hose Bib Vacuum Breaker

Backflow Scenarios:
This Backflow Scenario Diagram is representative of most of the Backflow situations encountered within Toho's service area. However, there may/will be unique scenarios that are not addressed by these diagrams. In these situations, please reach out to the Cross-Connection Control (Backflow) Program at BackflowCompliance@tohowater.com or (407) 944-5059 for assistance

INSPECTION AND TESTING:
All commercial backflow assemblies must be tested at the time of initial installation and every year thereafter and the results recorded with TWA. Backflow assemblies must be tested after repair or replacement. The property owner is responsible for the testing, maintenance and repair or replacement of these assemblies. Test results must be reported to TWA. A Toho approved inspection tag containing the test date (mm/dd/yyyy) and passing status must be placed on the assembly when testing is complete.

All residential backflow assemblies must be tested at the time of initial installation and every 2 years thereafter and the results recorded with TWA. Backflow assemblies must be tested after repair or replacement. TWA is responsible for the testing, maintenance and repair or replacement of these assemblies.

Dual check backflow valves will be replaced every 10 years or at the time of a service meter changeout.

TWA shall have the right to access the premises at any reasonable time to conduct inspections, testing, repair or replacement of applicable backflow assemblies.

All backflow assembly testers must be certified by a TWA approved organization based in the State of Florida. Testers must register with TWA in order for their results to be accepted. At any time, TWA may ask an approved tester to perform bench tests to demonstrate proficiency of their testing skills. All of the testers' equipment current certification/calibration data sheets must be registered with TWA.

If a backflow assembly has not been tested by a certified tester and the results received and acknowledged by TWA, service may be discontinued.

If a cross-connection is identified, a TWA authorized representative may deny or immediately discontinue service until the service location becomes in compliance. The cost of the reconnection and efforts to remedy the cross-connection will be at the customer's expense.

RECLAIMED INSPECTIONS:
Inspections will be performed at the time of initial connection and periodically thereafter to identify and eliminate any possible cross-connections. Upon discovery of any cross-connection between the plumbing system and any reclaimed water system on the customer's premises, TWA shall ensure that the cross-connection is eliminated. In reclaimed systems, the dual check valves are to be replaced at least every 7 years. Upon a potable jumpered system being switched to reclaimed, cross-connection inspections will be made at each affected address ahead of the system being charged with reclaimed water.

TWA maintains several 'jumpered' reclaimed irrigation systems. Jumpered systems are irrigation systems that are eventually intended for 'true reclaimed' service, but at this time do not have adequate volume from the reclaimed source and are thusly fed from potable water.

For reclaimed services, residential dual check valves shall be installed at the domestic meter and single check valves installed at the reclaimed meter.

SECTION 6: Record Keeping
RECORD KEEPING:
TWA shall keep all records and documentation related to backflow prevention for a minimum of 10 years in accordance with FDEP rules 62-555.360 and 62-550.720(3). All electronic data will be archived on a periodic basis to allow for database optimization.

All backflow assembly test reports shall be submitted electronically via the Backflow Program e-mail address at BackflowCompliance@tohowater.com. The cross-connection control program is in the process of converting to digital notification letters and online test entry. At the time this is implemented, we will no longer accept e-mailed, faxed, mailed or hard copies of test reports. All registered testers will be notified at least 2 months prior to the changeover of the change in procedures.

An inventory of all cross-connection related equipment will be maintained by TWA in an electronic database format. This will include:

- Backflow Serial Number
- Backflow Manufacturer and Model Number
- GPS Location of the Backflow Assembly
- Physical Address of the Backflow Assembly
- Associated Water Meter Number
- Installation Date
- All Calibration/Test Results
- All Repairs and Maintenance
- Removal/Replacement Date

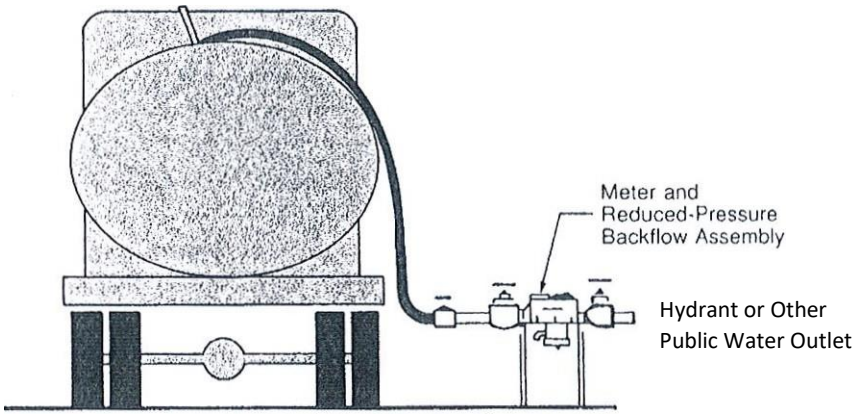
SECTION 7: Public and Customer Education
EDUCATION:
TWA may utilize the following methods to continue to educate customers and the general public about cross-connections:

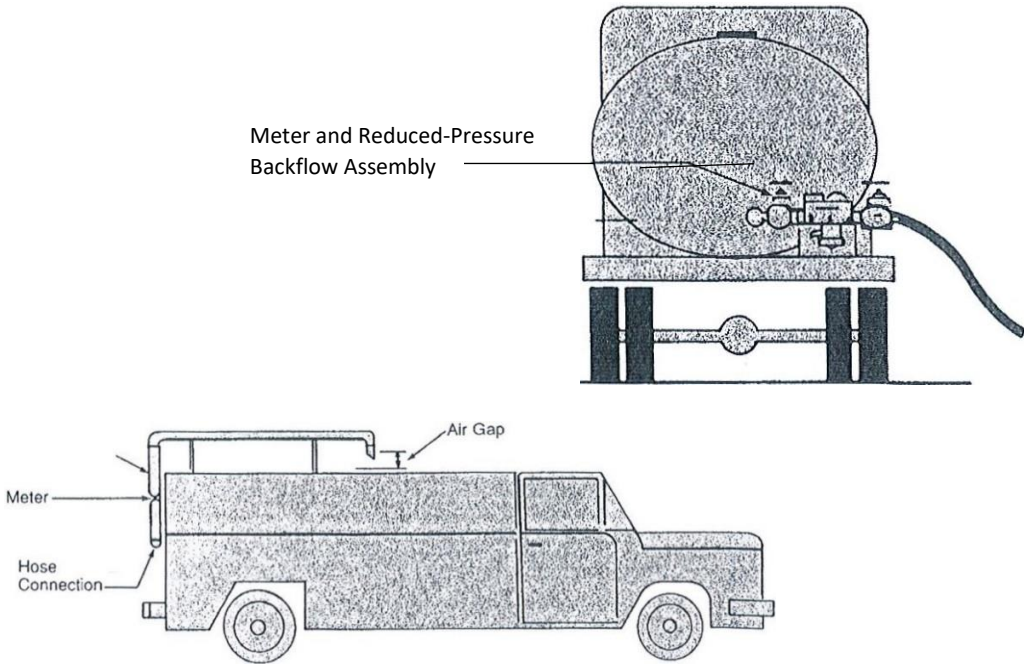
- Questionnaires
- Publish information regarding the cross-connection control program in the annual consumer confidence report
- Publish a brochure available on TWA's homepage or a physical version for handing out at physical events
- Billing inserts related to cross-connection control
- Advertising
- Door Hangers

SECTION 8: Fire Protection and Water Hauling Equipment
WATER HAULING EQUIPMENT:
This category includes any portable or non-portable spraying or cleaning units that can be connected to any potable water supply that does not contain adequate backflow protection. The hazards normally

found with this equipment include cross-connections between potable water and tanks containing toxic chemicals, pesticides, herbicides and fertilizers.

Recommended protection is a reduced pressure principle backflow prevention assembly as shown below. There may be situations where the maintenance of RPBA's on these portable units is suspect. For those circumstances, TWA may require an air gap be maintained for filling such tanks.





FIRE PROTECTION RECOMMENDATIONS:
A valve must be installed between the distribution main and the beginning of the fireline backflow assembly if no meter is present. The downstream backflow assembly shutoff valve cannot be the main source of shutting off a fireline.

All commercial and multi-family residential projects with fire sprinkler systems shall be required, as a minimum, to install an approved DCDA (Double Check Detector Assembly). When chemical injection is used downstream, an RPDA (Reduced Pressure Detection Assembly) must be installed.

All dedicated fire services shall require a detector check assembly which shall be designed and installed per applicable fire and life safety code(s).

The property owner must test all fireline backflow assemblies on an annual basis. A report of the results of the test and any corrective actions taken must be submitted to TWA within 30 days of completion of testing of each fireline backflow assembly. No more than 12 months may lapse between annual test dates. Fireline Backflow assemblies that fail a test must be replaced or repaired and retested within 30 business days of the original test. Failure to comply may result in the termination of domestic service.

Class 1: Direct connections from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets. (Figure 8.1)

Class 2: Same as Class 1 except that booster pumps may be installed in the connections from the street mains (booster pumps do not affect the potability of the system). It is necessary that pressure in the water main is reduced below 10 psi (69 kPa) to avoid drawing too much water from the main. (Figure 8.2)

Class 3: Direct connection from public water supply mains, plus one or more of the following: elevated storage tanks; fire pumps taking suction from aboveground covered reservoirs, or tanks; and pressure tanks. (All storage facilities are filled or connected to public water only, the water in the tanks are to be maintained in a potable condition. Otherwise, Class 3 systems are the same as Class 1. (Figure 8.3)

Class 4: 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 1700ft (518m) of the pumper connection. (Figure 8.4)

Class 5: 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. (Figure 8.5)

Class 6: Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks. (Figure 8.6)

Figure 8.1. Class 1 Fire Protection System

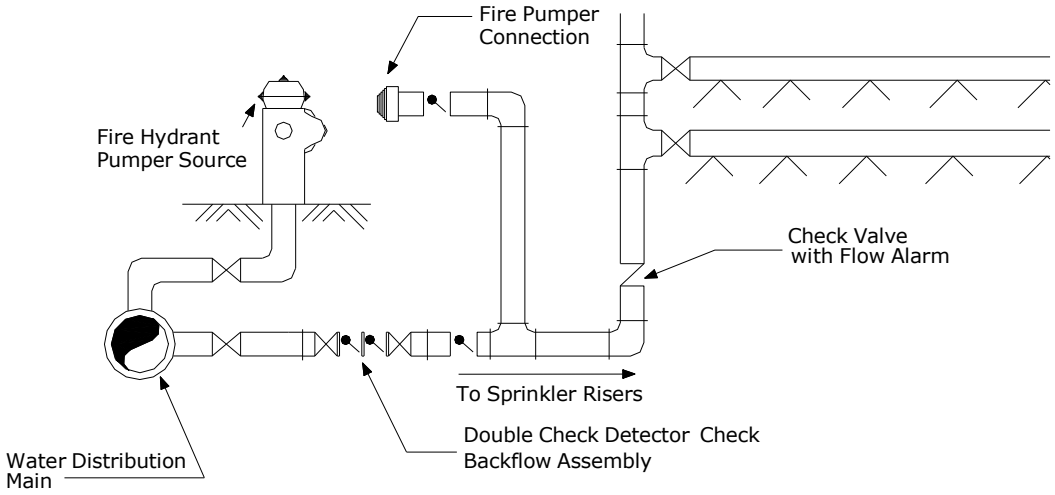


Figure 8.2. Class 2 Fire Protection System

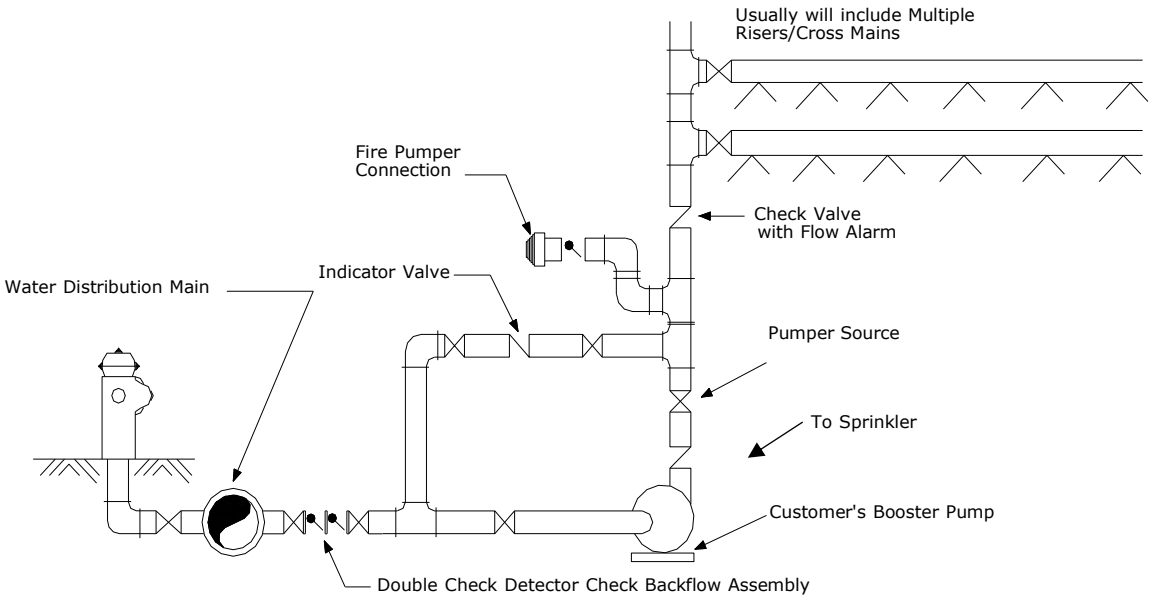


Figure 8.3. Class 3 Fire Protection System

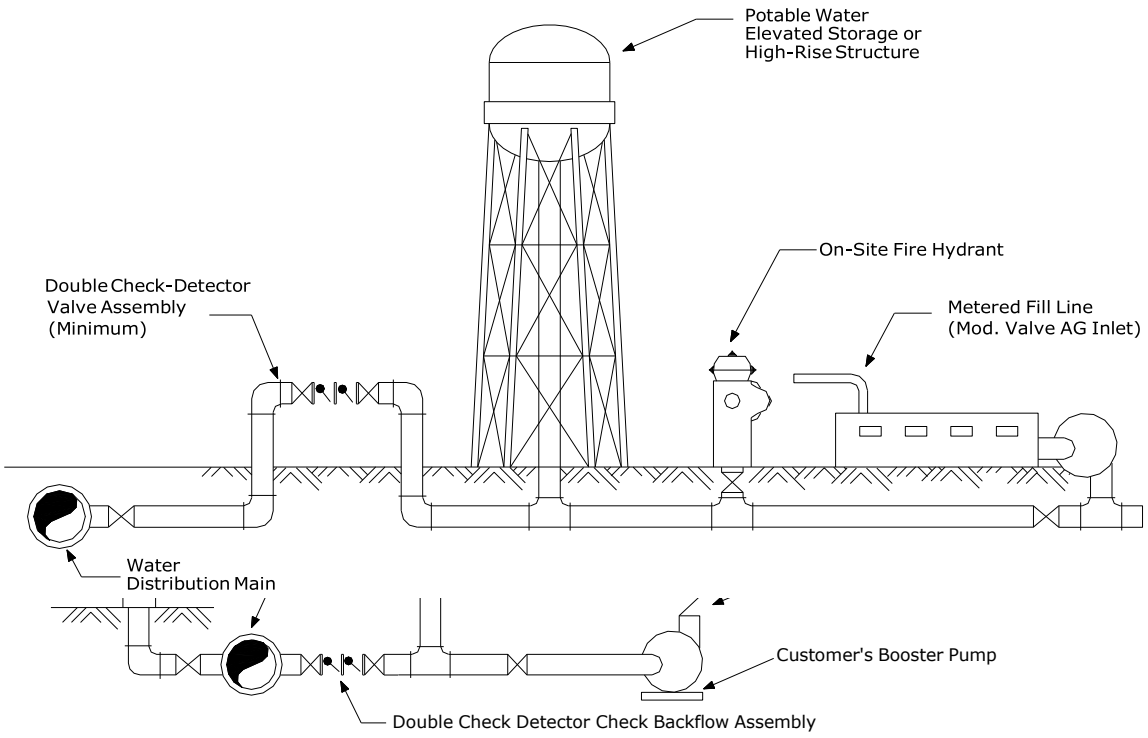


Figure 8.4. Class 4 Fire Protection System

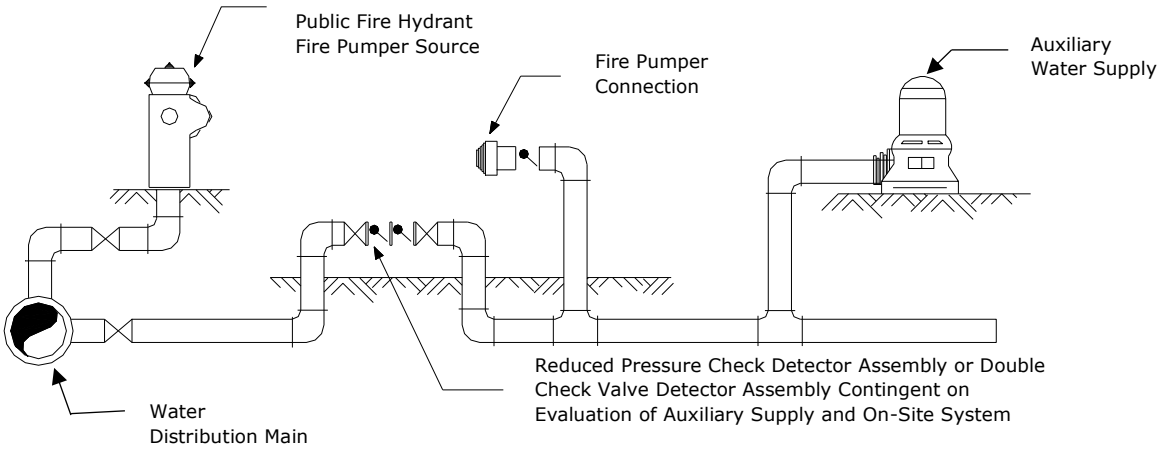


Figure 8.5. Class 5 Fire Protection System

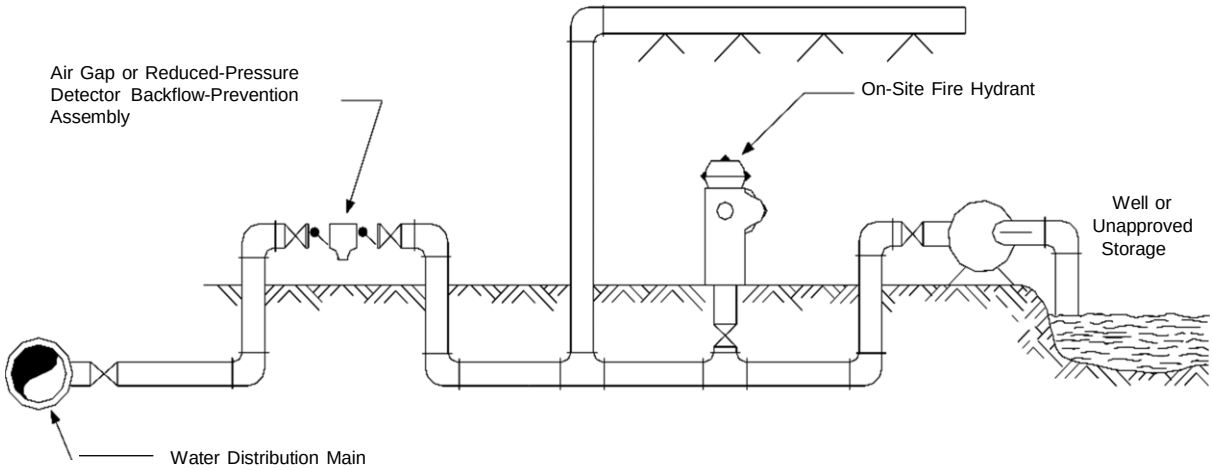
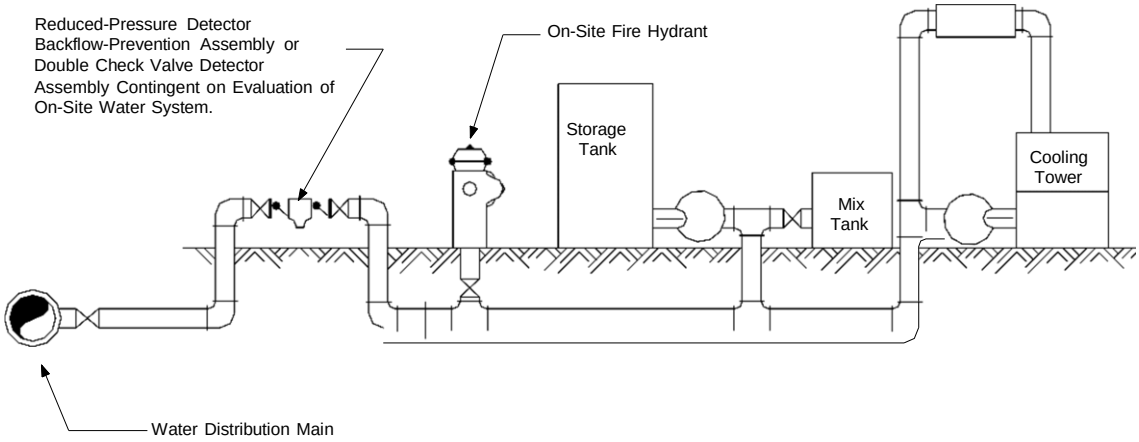


Figure 8.6. Class 6 Fire Protection System



Appendix A

Backflow Device By Customer Type

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

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 system4,5	A. At or for a residential service connection6: DuC7 B. At or for a non-residential service connection6: DC if the auxiliary or reclaimed water is a low hazard8,9; or RP if the auxiliary or reclaimed water is a high hazard8,9
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
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 II. Is connected internally to the customer's plumbing system	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 II. None11
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 connection12 II. Is connected internally to the customer's plumbing system	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 system4,13 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 system4,13 II. None11
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

Category of Customer	Minimum Backflow Protection[1] to Be Provided at or for the Service Connection from the CWS to the Customer
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.

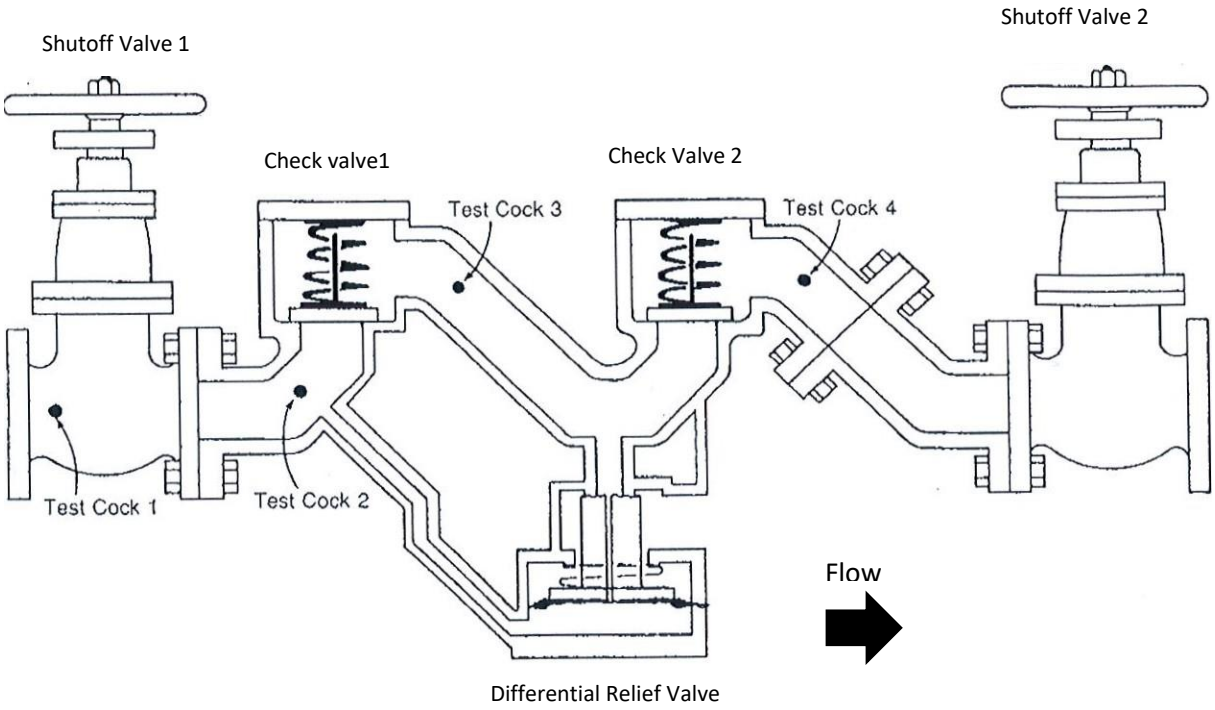
Rulemaking Authority 403.086(8), 403.853(3), 403.861(9) FS. Law Implemented 403.086(8), 403.852(12), 403.853(1), 403.855(3), 403.861(17) FS. History–New 11-19-87, Formerly 17-22.660, Amended 1-18-89, 1-3-91, 1-1-93, Formerly 17-555.360, Amended 8-28-03, 5-5-14.

Appendix B

Additional Installation Guides

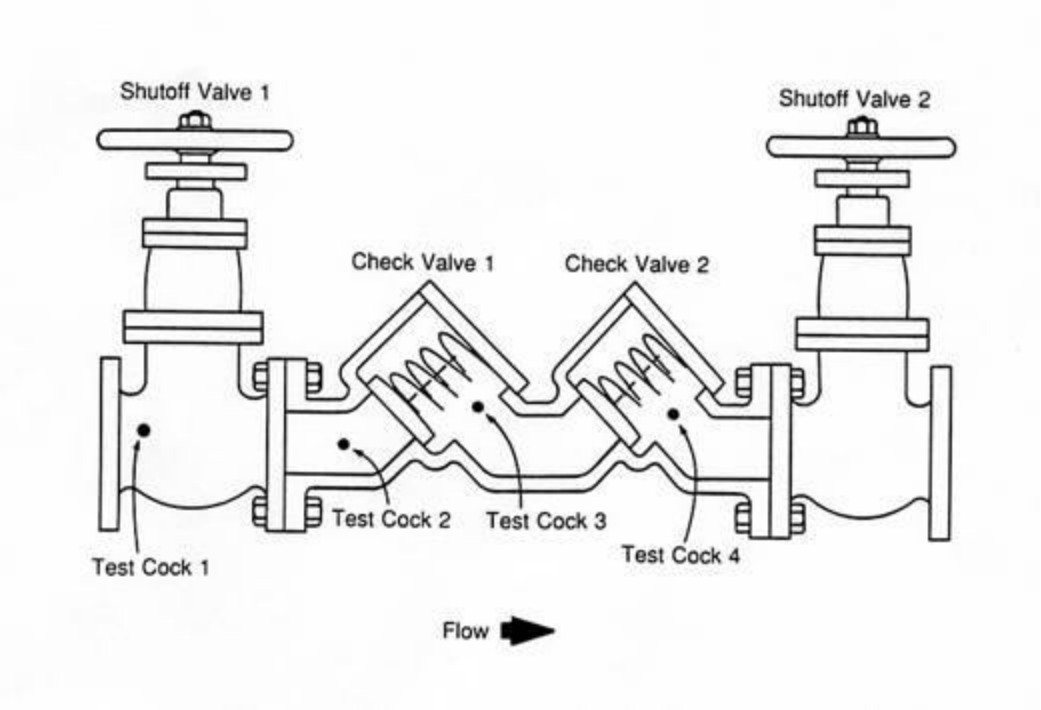
Reduced Pressure Backflow Assembly (RPBA). The following are several design installation specifications. For more information, refer to the manufacturer's recommendations and/or local standards.

- The RPBA shall be installed with adequate space to facilitate maintenance and testing. Ideally, the installation should not require platforms, ladders, or lifts for access.
- Adequate clearance from the floor, ceiling, and walls must be provided to facilitate the removal of the relief valve and/or check valves.
- Before selection and installation, 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, the hot-water type of assembly must be used. Consult manufacturer's specifications for recommendations.
- An RPBA shall not be installed in a pit below ground level. Semi buried pits are acceptable if the RPBA is installed above the ground or the maximum flood level with an approved air gap between the relief valve port and the daylight drain.
- If the relief valve port is submerged in groundwater, a Cross-Connection is created that may be more serious than the hazard that the assembly isolates.
- The daylight drain from aboveground or semi buried vaults must provide:
    1. Adequate drainage for the discharge from the reduced-pressure principle assembly relief valve port. Minimum RPBA relief valve flow rates and minimum diameter of relief valve porting are set forth in AWWA Standard C5111 or the *Manual of Cross-Connection Control* .
    2. Access for maintenance and periodic testing.



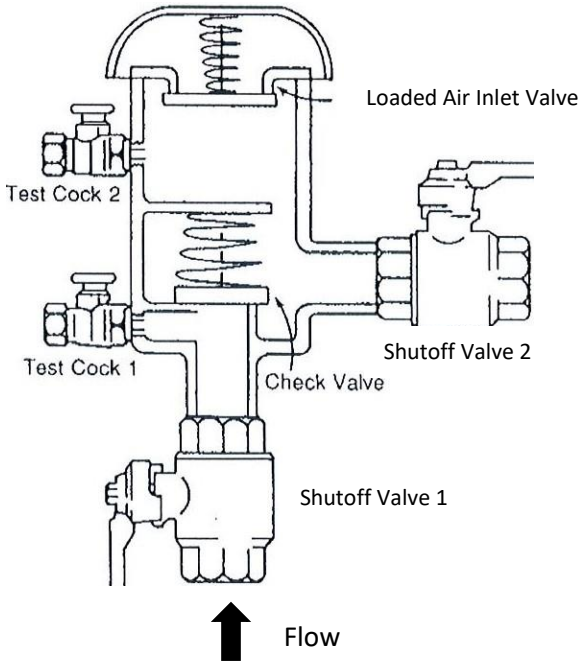
Double Check Valve Assembly (DCVA). The following are design installation specifications. For more information, refer to the manufacturer's recommendations and/or local standards.

- The DCVA should be installed with adequate space to facilitate maintenance and testing and should have free access without the use of platforms, ladders, or lifts.
- The assembly should be sized hydraulically, taking into account both the flow rate requirements of the service and the head loss of the assembly. The head loss of the assembly is not necessarily directly proportional to flow. (Refer to the manufacturer's head loss pressure curves.)
- A DCVA should not be installed below ground level unless provided with adequate drainage to maintain a dry location. Where an assembly must be installed in a location that is susceptible to flooding, such as a basement, the test cocks shall be plugged.



Pressure Vacuum Breaker Assembly (PVB). The following are several design installation considerations. For more information, refer to the manufacturer's specifications. If the PVB is used to isolate a health hazard, the potential for circumvention of the assembly and/or the possibility of backpressure exists, then premises isolation with an RPBA may be necessary.

- The PVB is designed to operate under constant pressures for long periods of time.
- The PVB shall be installed at least 12 in. (305 mm) above all downstream piping and the highest fixture flood level rim, outlet, or highest point of water use.
- 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. Provide adequate drainage to floor drains to accommodate this spillage.
- 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.


Loaded Air Inlet Valve
Test Cock 2
Shutoff Valve 2
Test Cock 1
Check Valve
Shutoff Valve 1
Flow