

RESOLUTION NO. 2023-07

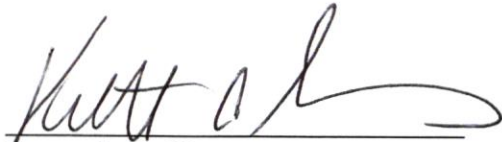
**A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF HILLIARD, FLORIDA, A MUNICIPAL CORPORATION AMENDING THE TOWN OF HILLIARD'S CROSS-CONNECTION CONTROL PROGRAM & BACK-FLOW PREVENTION DEVICES POLICY, FOR THE TOWN OF HILLIARD; AND PROVIDING AN EFFECTIVE DATE.**

**WHEREAS**, as part of an effort to ensure the health and safety of the Town's public water supply and to be in compliance with the Town's Ordinance No. 2015-01, the Town has put together a Cross-Connections & Back-Flow Prevention Devices Policy to monitor the Town's public water distribution system;


**NOW, THEREFORE, BE IT RESOLVED**, by the Town Council of the Town of Hilliard, Florida that the following Cross-Connections & Back-Flow Prevention Devices Policy is hereby adopted for the Town of Hilliard.

Effective date of this Cross-Connection Control Program & Back-Flow Prevention Devices Policy shall be July 1, 2023.


Adopted this 20<sup>th</sup> day of April, 2023, by the Hilliard Town Council, Hilliard, Florida.

  
Kenneth A. Sims  
Council President

ATTEST:

  
Lisa Purvis  
Town Clerk

APPROVED:

  
John P. Beasley  
Mayor

# **Town of Hilliard**

## **Cross-Connection Control Program**

~~Program Manager:~~  
~~David Thompson, Public Works~~  
~~Director~~  
Cross Connection Control Manager  
John Maze

Ordinance No. 2015-01  
Cross-Connections & Back-Flow Prevention Devices

# FORWARD

This "Manual of Cross-Connection Control" has been prepared by the Department of Public Works of the Town of Hilliard, Florida, to establish an effective cross-connection control program in the Town's water service area in accordance with directives issued at the Federal level. The manual has been adopted by the Town Council through Town ordinance. Responsibilities for the control of cross-connections are shared by the consumer, this department, Town Building inspectors, the Florida Department of Health and Rehabilitative Services, and the Florida Department of Environmental Protection. The Town intends to supply the safest and best drinking water possible to its service area through an ongoing quality program of potable water delivery. The basic procedure for ensuring the proper function of the public water supply through a coordinated program to prevent pollution or contamination of potable water supplies by cross-connections is contained herein. This manual provides and extends present guidelines for the Town's Potable Water Distribution Systems by providing a means of detecting and eliminating unprotected cross-connections in the interest of public safety. The Town enjoys a positive relationship with its customers, and community support is required for this program to be successful. The Town encourages and promotes the education and commitment of its customers in the area of cross-connection control. It is the intent of the Town to implement the regulations and procedures as outlined herein, with full community cooperation of all related persons and agencies.

# INDEX

SECTION 1 INTRODUCTION.....	04
SECTION 2 OBJECTIVES.....	06
SECTION 3 RESPONSIBILITY.....	07
SECTION 4 POLICY.....	09
SECTION 5 INSPECTIONS.....	10
SECTION 6 DEFINITIONS.....	13
SECTION 7 APPLICABLE STANDARDS AND DESCRIPTIONS FOR BACKFLOW PREVENTION ASSEMBLIES AND DEVICES.....	19
SECTION 8 TESTING AND MAINTENANCE OF BACKFLOW PREVENTERS.....	23
SECTION 9 RESULTS OF NON-COMPLIANCE.....	27
SECTION 10 FIRE SYSTEMS.....	28



## **SECTION I INTRODUCTION**

A cross-connection is defined by the American Water Works Association (AWWA) as:

A connection or a potential cross-connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system. 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 odor to the water. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other temporary or permanent connection arrangement through which backflow may occur are considered to be cross-connections.

Backflow, literally a reversal in the normal direction of flow within a water system, is what turns a cross-connection into a health hazard. Consequently, cross-connections and the chance of backflow must be eliminated to prevent these "unseen hazards" from degrading the quality of water that water purveyors strive to maintain.

### **1.1 Purpose**

The purpose of a cross-connection control program is to prevent waterborne diseases and contaminants from entering the potable water distribution system and thus the water we drink. More exactly, the program is intended to prevent delivered water that has passed beyond the public water system and into the private distribution systems of consumers from re-entering the potable public distribution system and being subsequently delivered to other consumers. The program aims to protect the Department of Public Works and its consumers from water-using establishments which could possibly reduce the water quality and safety of the municipal potable water supply through backflow and/or cross-connections.

### **1.2 Legal Authority**

In Florida, the primary responsibility for safeguarding potable water quality on private property historically has been left to local health agencies and building inspection departments. The Safe Drinking Water Act, signed by President Ford on December 16, 1974, created new authority through a chain of laws and regulations that resulted in the state requirement (Florida Safe Drinking Water Act, § 403.850-403.864, Florida Statutes) for all public water systems to have a cross-connection control program. The Florida Department of Environmental Protection (FDEP), on December 19, 1994, adopted the following policy (62-555.360, F.A.C.):

(1) 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., shall establish and implement a routine cross-connection control program to detect and control cross-connections and prevent backflow of contaminants into the water system. This program shall include a written plan that is developed using recommended practices of the American Water Works Association set forth in *Recommended Practice for Backflow Prevention and Cross-Connection Control*, AWWA Manual M14, as incorporated into Rule 62- 555.330, F.A.C.

(2) Upon discovery of a prohibited cross-connection, public water systems shall either eliminate the cross-connection by installation of an appropriate backflow prevention device acceptable to the department or shall discontinue service until the contaminate source is eliminated.

### **1.3 Causes of Backflow**

Where cross-connections exist, protection against backflow is needed to reduce the possibility of contamination. The causes of backflow cannot usually be eliminated completely since backflow is often initiated by accidents or unexpected circumstances. However, some causes of backflow can be partially controlled by good design and informed maintenance. Listed below are the major causes of backflow as outlined under the two types of backflows, back siphonage and back pressure.

#### **Back siphonage**

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

The principal causes of back siphonage are:

1. A line repair or break which occurs at a lower elevation than the service point;
2. Undersized piping; and
3. Lowered pressure in a water main due to a high-water withdrawal rate such as firefighting, water main flushing, or water main breaks.

#### **Backpressure**

Backpressure may cause backflow to occur where a potable water system is connected to a non-potable piping system, and the pressure in the non-potable system exceeds that in the potable system. High pressures may be created by means of pumps, boilers, etc. There is a high risk of non-potable water being forced into the potable water system whenever these types of cross-connections are not properly protected with backflow prevention assemblies.

The principal causes of backpressure are:

1. Booster pump systems;
2. Potable water connections to boilers and other pressure systems;
3. Connections with a non-potable system which may at times have a higher pressure; and
4. Non-potable water stored in tanks or plumbing systems that, by virtue of their elevation, would create head pressure sufficient to cause backflow if pressure were lowered in the public system.

## **SECTION 2 OBJECTIVES**

The objectives of the Town of Hilliard Department of Public Works Cross- Connection Control Program are as follows:

1. To protect the Town of Hilliard's Public Potable Water Supply from the possibility of contamination by containing within its consumers' private water systems, contaminants or pollutants which could, under adverse condition, backflow through uncontrolled cross-connections into the public potable water system.
2. To eliminate or control existing cross-connections, actual or potential, between the consumers' on-premise potable water system(s) and non- potable water system(s) plumbing fixtures and industrial piping systems.
3. To provide a continuing inspection program of cross-connection control which will systematically and effectively control all actual or potential cross-connections which exist presently or may exist in the future.
4. To maintain an on-going information program to educate the community on cross-connection control and to encourage customer cooperation and coordination toward a successful cross-connection control program.



## **SECTION 3 RESPONSIBILITY**

### **3.1 Water Purveyor**

**a**

Under the Safe Drinking Water Act of 1974 and rules of the Florida Department of Environmental Protection (FDEP) Chapter 62-555.360 F.A.C. relating to cross connection, the water purveyor has the primary responsibility of maintaining a cross connection control program to prevent water from unapproved sources, or any other substances, from entering the public certification of the purveyor's public potable water supply for use on interstate carriers and rescission of the permit to supply public potable water.

Upon detection of a prohibited cross-connection, the Town of Hilliard Public Works Director is directed to ~~eliminate the cross-connection by requiring the installation of an approved backflow prevention assembly or device, or immediately discontinue service until the cross-connection is eliminated.~~ Immediately discontinue service until the cross-connection is eliminated. Additional protection may be required, such as a backflow preventor, if one is not on site.

The specific authorized person to act for the water purveyor (The Town of Hilliard) in relation to the cross-connection control program shall be the Cross Connection Control Manager.

### **3.2 Building Official**

The Building Official has the authority to review site and building plans and inspect plumbing as it is installed. They also have the authority to prevent the design or construction of cross-connections in structures within the Town's jurisdiction. The Building Official (also known as the Plumbing Official) carries this responsibility for the Town of Hilliard.

Where the review of site and building plans suggest or detects the potential for cross-connections being made as an integral part of the plumbing system, the Plumbing Official has the authority under the Florida Building Code 2004/Plumbing to require such cross-connection practices be either eliminated or provide approved backflow protection.

The Plumbing Official's authority begins at the point of service (the downstream or consumer's side of the meter) and carries throughout the entire length of the site.

Building clarification should be made about the intended use of water at any point where it is suspected that a cross-connection might be made or where one is actually called for by the plans. When cross-connection potential is discovered, it is mandatory that a suitable, approved backflow prevention assembly or device be required on the plans and properly installed. Review of site and building plans may include input, when necessary, from the Cross-Connection Control Program Manager and the Public Works Director to coordinate the proper location and application of approved backflow prevention assemblies and devices.

If a potential cross-connection is discovered by the Cross-Connection Control Program Manager on the consumer's side of the meter, emergency action may be deemed appropriate (Refer to Section 5.03 Emergency Procedures).

### **3.3 Consumer**

The consumer's responsibility starts at the point of service from the public potable water system and includes all of the consumer's water system(s). The consumer, at his own expense, is required to install, operate, test and maintain approved backflow prevention assemblies, as directed by the Cross-Connection Control Program Manager in accordance with the Town's

backflow prevention containment policy. The consumer must maintain accurate records of tests and repairs made to backflow prevention assemblies and provide the Cross-Connection Control Program Manager with copies of such records. The records are required to be on forms approved or provided by the Cross-Connection Control Program Manager. In the event of accidental pollution or contamination of the public or consumer's potable water system due to backflow on or from the consumer's premises, the consumer shall promptly take steps to confine further spread of pollution or contamination within the consumer's premises and is required to immediately notify the Cross-Connection Control Program Manager of the hazardous condition.

### 3.4 Backflow Prevention Assembly Installers

The installer's responsibility is to ensure proper installation of backflow prevention assemblies in accordance with the manufacturer's installation instructions and those furnished by the Cross-Connection Control Program Manager. The installer is also responsible for conducting a test of the assembly when it is installed and is required to furnish the following vital data to the Town of Hilliard Cross-Connection Control Program Manager immediately after test completion. ~~A reduced pressure principal backflow prevention assembly.~~

A (RPBA), or a double check valve assembly (DCVA), or a pressure vacuum breaker (PVB) assembly is installed: can be used. Instruction on which type will be determined by Policy Section 4 with the final determinization by the Cross Connection Control Manager.

The information to be furnished by the installer at new installations shall be as follows:

1. service address where the assembly is located.
2. owner
3. description of assembly's location
4. date of installation
5. type of assembly
6. manufacturer
7. model number
8. backflow prevention device serial number
9. water meter number
10. water meter reading
11. test kit serial number
12. date test kit last calibrated.
13. tester name and testing certification number.
14. company name, address and phone number
15. time of day

Testing at the time of installation for all RPBA's, and DCVA's, ~~and~~ PVB's shall be performed by a certified backflow prevention assembly technician (reference section 6 for definition and explanation of Backflow Prevention Assembly Tester-Certified). Test results are to be provided immediately to the Cross-Connection Control Program Manager.



## **SECTION 4 POLICY**

It is the primary goal and intent of the Town of Hilliard's Cross-Connection Control Program; to protect the integrity of the potable water distribution system from any contaminant entering the potable water system, which would adversely affect the health and well-being of its customers. In order to help facilitate this, the following policies will be adhered to:

The Town of Hilliard will initiate its containment program by continuing to conduct inspections on all properties which have a service connection to the potable water system.

- A. For containment purposes, all commercial and multifamily properties shall have an approved RP (Reduced Pressure Backflow Prevention Assembly) installed on the potable water service line.
- B. Properties with an auxiliary water supply such as private wells, lakes, rivers, etc. (excluding reclaimed water) shall have an RP (Reduced Pressure Backflow Prevention Assembly) installed at the service connection.
- C. Private Wells shall not be interconnected or physically linked in any way to the public potable water system.
- D. Potable water irrigation systems shall be required to have an RP (Reduced Pressure Backflow Prevention Assembly) or ~~PVB (Pressure Vacuum Breaker)~~ installed according to the Town's Cross-Connection Control Manual {(sec. 2-b) example}. Any irrigation system on potable or reclaimed water which has an injection system for fertilizers, chemicals or any other hazardous material, gas or liquid shall have an RP (Reduced Pressure Backflow Prevention Assembly) installed at the service connection or at a location determined by the cross-connection control program manager.
- E. Private swimming pools are required to have either RP or DCVA type backflow preventor.

## **SECTION 5 INSPECTIONS**

The Town of Hilliard has the continuing authority to inspect all residential, industrial and commercial users of potable water, where pollution, health, or system hazards may exist or be created; where materials dangerous to health are handled in tanks, piping systems, or other vessels on the premises, or where the water system is unstable and cross-connections may be installed. The following policies to cross-connections will apply:

1. Should the connection be between two (2) approved public potable water supplies, common gate or check valves may be used, provided this has the approval of both water suppliers and the Florida Department of Environmental Protection (FDEP).
2. Should the connection be between an approved public potable water supply and a service or other water supply which, has or may have, any material in the water dangerous to health or may be handled under pressure, subject to negative pressures, protection shall be by an approved air gap separation (AG). The air gap shall be located as close as possible to the service cock or other connection to the approved supply. All piping between such connection and approved air gap shall be entirely visible. If these conditions cannot reasonably be met, the public potable water supply shall be protected alternatively with an approved Reduced Pressure Principle Backflow Prevention Assembly (RPBA), provided the alternative is acceptable to the Public Works Director and the Florida Department of Environmental Protection (FDEP).

### **5.1 Frequency**

Due to changes in models or components of equipment, methods of manufacturing and additions to plants, buildings, etc., water user requirements undergo continual changes. As a result, new cross-connections may be installed and existing protection may be by-passed, removed or made otherwise ineffective; therefore, an annual, biannual, or more frequent detailed inspection by the Cross-Connection Control Program Manager or his designee's of all water usage is required. In addition, all new building construction shall also be plan checked and inspected during installation by the Plumbing Official and/or a designee from the Public Works Department to ensure conformance with the Town's cross-connection control requirements.

### **5.2 New Construction**

All new construction plans and specifications for individual or commercial facilities shall be submitted to Town Hall for evaluation by the Department of Public Works and the Building Official through the Concurrency Application process. The Department of Public Works and Building Official shall review the plans to determine what degree of possible cross-connection hazards are posed to the public potable water supply and what approved backflow prevention assemblies or devices are required to insure conformance with cross-connection control containment requirements. Evaluation shall include input from the Cross-Connection Control Program Manager to coordinate the proper location and application of approved backflow prevention. Cross-connection control shall be accomplished by a combination of plans review and field inspections.

Upon completion of the plans evaluation, the consumer will be notified through the Building Department of the ~~Public Works~~ Cross-Connection Control requirements.

If adequate plans and specifications are not available and no realistic evaluation of proposed



water uses can be made, the consumer shall be advised that the installation of backflow prevention assemblies or other controls shall be necessary.

In conjunction with its inspection and testing of all new plumbing, ~~the Plumbing Official~~ Public Works will inspect and require testing and ~~approve- approval or disapprove- disapproval of~~ the completed backflow prevention device installation. Field inspections during construction or immediately after will also serve to identify hazards that were not apparent during plans review or were introduced during construction. The Plumbing Official and Public Works ~~is- are~~ responsible for field inspection to determine compliance with plumbing the backflow prevention regulations. The Cross Connection Control Program manager will assist the Plumbing Official, as necessary, to ensure compliance. ~~And field testing-i~~

After final approval of the installation and satisfactory test results, in accordance with plumbing codes and cross-connection rules and regulations, a report will be completed and filed by the Cross-Connection Control Program Manager. ~~with the concurrence of the Plumbing Official.~~ This report will include size, model, location, and all other pertinent details of the installation including satisfactory test results attested to by a certified tester.

All non-residential construction of any building to be served by the Town water system shall be plan-checked and inspected by the Plumbing Official and Public Works for compliance with the Town's cross-connection control containment requirements prior to connection to the Town's potable water main.

For containment purposes, all commercial and multifamily properties shall have an approved RP (Reduced Pressure Backflow Prevention Assembly) installed at the domestic water service connection.

### **5.3 Emergency Procedures**

Upon discovery of a hazardous situation where contaminants are actually in the process or suspected of entering the distribution system of the public potable water supply, the Cross-Connection Control Program Manager shall be notified immediately as well as the Town of Hilliard Public Works Director.

The Cross-Connection Control Program Manager is authorized to take immediate steps he deems necessary to correct a hazardous condition, which shall include the right to immediately discontinue potable water service to premises where a hazardous condition may be occurring. Such emergency steps, including discontinuance of potable water service, may be taken without advance notice to the consumer. The consumer shall be notified as soon as possible thereafter if potable water service has been discontinued; and the matter simultaneously brought to the attention of the Town Attorney's Office and the Office of the Town's Director of Public Works.

In the event of a contaminant entering the Potable Water distribution system, the following procedures will be followed:

- |        |  |
|--------|--|
| Step 1 | <b>Investigate</b> <ul style="list-style-type: none"><li>• Identify and isolate source of contaminant (if possible)</li><li>• Conduct sampling to identify contaminant and extent of contamination.</li><li>• Notify Health Department</li></ul> |
| Step 2 | <b>Containment</b> <ul style="list-style-type: none"><li>• Conduct directional flushing to purge contaminant from system.</li></ul>  |

- Close appropriate system valves to contain contaminant.
- Continue sampling until the system is clear of contaminants.

Step 3

**Notification**

- Door hangers
- Radio
- T.V.
- Newspaper

## **SECTION 6 DEFINITIONS**

### **AIR GAP (AG) SEPARATION**

A physical separation between the free-flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. An approved air-gap separation shall be a distance of at least two (2) times the diameter of the supply pipe measured vertically above the top rim of the vessel - with a minimum distance of one (1) inch.

### **APPROVED**

1) The term approved, as herein used in reference to a water supply, shall mean potable water supply that has been approved by the Florida Department of Environmental Protection (FDEP).  
2) The term approved, as herein used in reference to air gap separation, a Double Check Valve Assembly, a Pressure Vacuum Breaker, or a Reduced Pressure Principle Backflow Prevention Assembly shall mean as approved by the Town of Hilliard. (See Backflow Prevention Assembly Approved) Other backflow prevention devices or methods may be approved by the Town of Hilliard Director of Public Works for unique installations on an individual basis.

### **APPROVED WATER SUPPLY**

The Town of Hilliard potable water system or any public potable water supply which has been approved by the Florida Department of Environmental Protection (FDEP).

### **ATMOSPHERIC VACUUM BREAKER (AVB)**

The AVB consists of a float check, a check seat, and an air inlet port. A shutoff valve immediately upstream may or may not be an integral part of the device. The AVB is designed to allow air to enter the downstream water line to prevent back siphonage. This unit may never be subjected to a backpressure condition, have a downstream shutoff valve, or be installed where it will be in continuous operation for more than 12 hours.

### **AUXILIARY INTAKE**

Any piping connection or other device whereby water may be secured from a source other than that normally used.

### **AUXILIARY WATER SUPPLY**

Any water supply on or available to the premises other than the water purveyor's approved public water supply. These auxiliary waters may include water from another water purveyor's public potable water supply or any natural source(s), such as a well, lake, spring, river, stream, harbor, and so forth; or used waters, reclaimed waters, recycled 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 water purveyor does not have sanitary control.

### **BACKFLOW**

The undesirable reversal of the flow of water or other liquids, mixtures, gases, or other substances into or towards the distribution piping of a potable supply of water from any source



or sources.

### **BACKFLOW PREVENTION (BP) ASSEMBLY- APPROVED**

An assembly that has been investigated and approved by The Town of Hilliard and has been shown to meet the design and performance standards of the University of Southern California / Foundation for Cross-Connection Control and Hydraulic Research (USC/FCCHR) and/or the American Water Works Association (AWWA). The approval of backflow prevention assemblies by The Town of Hilliard is based on a favorable report by an approved testing laboratory, recommending such an approval. An approved Backflow prevention assembly is comprised of one or more approved body components including shutoff valves and is used to prohibit the backflow of water into the potable water system.

### **BACKFLOW PREVENTION ASSEMBLY TESTER – CERTIFIED**

A person who has proven his/her competency to test, repair and maintain backflow prevention assemblies as evident by a certification that is recognized by the approving authority to the satisfaction of The Town of Hilliard.

### **BACKFLOW PREVENTION (BP) DEVICE - APPROVED**

A device that has been investigated and approved by The Town of Hilliard and has been shown to meet the design and performance standards of the American Society of Sanitary Engineers (ASSE) and/or the American National Standards Institute (ANSI).

### **BACK PRESSURE**

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

### **BACK SIPHONAGE**

A reversal of the normal direction of flow in the pipeline due to a negative pressure (vacuum) being created in the supply line with the backflow source subject to atmospheric pressure.

### **CONSUMER**

Any person, firm or corporation using or receiving water from the Town of Hilliard potable water system.

### **CONSUMER'S WATER SYSTEM**

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

### **CONTAINMENT**

The practice of installing an approved backflow prevention assembly on the consumer's potable water system to protect against contamination of the public potable water system from a non-potable source.

## **CONTAMINATION**

An impairment of the quality of the Town of Hilliard potable water supply by sewage, industrial fluids or any other foreign substance to a degree which created an actual hazard to the public health through the potential spread of disease or toxic materials.

## **CRITICAL LEVEL**

The marking on a vacuum breaker which determines a minimum elevation above the flood level rim of the fixture or receptacle served at which the device may be installed.

## **CROSS-CONNECTION**

A connection or a potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system. Other substances may be 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 changeover assemblies, or any other temporary or permanent connection arrangement through which backflow may occur are considered to be cross-connections.

## **CROSS-CONNECTION CONTROL PROGRAM MANAGER**

The person designated by the Town of Hilliard Public Works Department to implement the Town of Hilliard's Cross-Connection Control program and ensure compliance with Federal and State regulations.

## **DOUBLE CHECK VALVE ASSEMBLY (DCVA)**

A complete 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 non-health hazards (i.e., a pollutant).

## **DUAL WATER SYSTEM**

Water distribution facilities that distribute two grades of water to the same service area: one potable and the other reclaimed. The quality, quantity and pressure available in each system are functions of the sources and intended uses for each grade of water.

## **FIRE SPRINKLER SYSTEM**

A sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection and engineering standards.

## **FLOOD LEVEL RIM**

The edge of the receptacle from which water overflows is the flood level rim.

## **HAZARD - DEGREE OF**

A qualification of what potential and actual harm may result from cross-connections within a water-using facility. Establishing the degree of hazard is directly related to the type and toxicity of contaminants that could feasibly enter the potable water system and can be classified as either a "pollutant" (low hazard) or a "contaminant" (high hazard).

### **HAZARD - HIGH**

An actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the consumer's potable water system to such a degree or intensity that there would be a danger to health.

### **HAZARD - LOW - (NON-HEALTH)**

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

## **HEALTH AGENCY**

The Florida State Department of Health and Rehabilitative Services (DHRS).

## **INTERNAL PROTECTION**

See Isolation.

## **ISOLATION**

The practice of installing an approved backflow prevention assembly or device at the source of the potential contamination. The Plumbing Official shall be responsible for enforcement of Cross-Connection Control as it pertains to isolation.

## **LABORATORY - APPROVED TESTING**

Reference to an approved testing laboratory shall mean the University of Southern California/Foundation for Cross-Connection Control and Hydraulic Research (USC/FCCCHR), or any other laboratory having the equivalent facilities for both the laboratory and field evaluation of the assemblies or devices approved by the American Water Works Association (AWWA) or American Society of Sanitary Engineers (ASSE).

## **PLUMBING OFFICIAL**

The individual, board, department, or agency established and authorized by state, county, city or other political subdivision created by law to administer and enforce the provisions of the Florida Building Code 2004/Plumbing as adopted or amended.

## **PLUMBING SYSTEM**

The potable water supply and distribution pipes; plumbing fixtures and traps; soil, waste and vent pipes; building drains and building sewers, including their respective connections, devices



and appurtenances within the property line of the premises; and water-treating or water-using equipment.

#### **POINT OF SERVICE/SERVICE CONNECTION**

The terminal end of the potable water system, i.e., where the water purveyor loses jurisdiction and sanitary control over the water at its point of service to the consumer's water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end or consumer's side of the meter. There shall not be any unprotected connections between the point of service and the backflow prevention assembly or device.

#### **POLLUTION**

An impairment of the quality of water to a degree that does not create an actual hazard to the public health, however it adversely affects it for domestic use.

#### **POTABLE WATER**

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

#### **PRESSURE VACUUM BREAKER ASSEMBLY (PVB)**

An assembly consisting 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 designed to be operated under pressure for prolonged periods of time to prevent back siphonage. The pressure vacuum breaker may not be subjected to backpressure.

#### **REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (RP)**

A complete assembly consisting of a mechanical, independently acting, hydraulically dependent relief valve, located between two independently operating, internally loaded check valves that are located between two tightly closing resilient seated shutoff valves with four properly placed resilient seated test cocks.

#### **RESIDENTIAL DUAL CHECK (RDC)**

A device consisting of two independent check valves which have been approved by the Town of Hilliard for use to protect the potable water system at the single-family customer's service(s) where no other backflow hazards exist. Such valves must meet the requirements of ASSE 1024. These devices will be installed and maintained by the Town of Hilliard on all single-family services 1" and smaller.

#### **UNAPPROVED WATER SUPPLY**

Water which has not been approved for human consumption by the health agency having jurisdiction.

**USED WATER**

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

**WATER PURVEYOR**

The owner or operator of a public (or private) potable water works system.



## **SECTION 7**

### **APPLICABLE STANDARDS AND DESCRIPTIONS FOR BACKFLOW PREVENTION ASSEMBLIES AND DEVICES**

#### **7.1 Applicable Standards**

The following specifications or requirements of approving agencies are recognized by the Town of Hilliard. All backflow prevention assemblies, devices and conditions of cross-connection control shall be in compliance with the standards set forth by one or more of the following agencies. The Town of Hilliard reserves the right to state which standards apply if and when conflicts between standards arise.

ANSI	American National Standards Institute - #A112. I.2.
AWWA	American Water Works Association - Manual M14 3rd edition
ASSE	American Society of Sanitary Engineers - # 1001, #1011, #1012, #1013, #1015, #1020, #1024, #1032, #1035
USC /	University of Southern California /
FCCCR	Foundation for Cross Connection Control and Hydraulic Research Manual of Cross- Connection Control, 9th edition, 1993

Florida Building Code 2004/Plumbing

The Cross-Connection Control Program Manager will maintain a list of approved assembly and device manufactures for use within the Town of Hilliard potable water service area. This list shall be specified by the USC/FCCCHR.

#### **7.2 Abbreviations for Protective Assemblies and Devices**

AG	Air Gap
AVB	Atmospheric Vacuum Breaker
BP/IAV	Backflow Preventer with Intermediate Atmospheric Vent
DCVA	Double Check Valve Assembly
DDCV	Double Detector Check Valve Assembly
HBVB	Hose Bibb Vacuum Breaker
PVB	Pressure Vacuum Breaker
RDC	Residential Dual Check
RPBA	Reduced Pressure Principle Backflow Prevention Assembly
SPV	Spill Proof Resistant Vacuum Breaker

### 7.3 Types and Descriptions of Hazards

The following definitions apply to hazard conditions existing at a site where backflow prevention assemblies and devices may be required.

Degree of Hazard	Definition
Low	A condition where a polluting substance may come in contact with potable water aesthetically affecting the taste, odor or appearance, but not hazardous to health (non-toxic), (e.g., pollution hazard).
High	A condition where a contaminating substance may come in contact with potable water causing sickness or death (toxic), creating a health hazard (e.g., system hazard, plumbing hazard).

The table on pages 20-21 lists the types and applications of backflow prevention assemblies and devices, a brief description of each assembly or device, typical installation conditions, and applicable standards.

### 7.4 Facilities/Plumbing Arrangements Requiring Backflow Prevention Assemblies

1. Commercial/Industrial properties shall have an approved Reduced Pressure Principle Backflow Prevention Assembly (RPBA) installed on the potable water service line which feeds the property.
2. Multi-family/Apartment Complex's/Condominiums shall have an approved Reduced Pressure Backflow Prevention Assembly (RPBA) installed on the potable water service line.  
**Note: Any facility, device, equipment, plumbing arrangement or situation not covered by this manual, which may constitute a potential health hazard will be handled at the discretion of the Cross-Connection Control Program Manager**
3. Residential properties or any other properties with an auxiliary water supply or system, such as private wells, lakes, streams, canals etc. (excluding reclaimed water) shall have a Reduced Pressure Backflow Prevention Assembly (RPBA) installed at the potable water service connection.  
**Note: Private Wells shall not be interconnected or physically linked in any way, with or without a protective assembly to the potable water system.**
4. Lawn sprinkler systems on potable water shall have a Reduced Pressure Backflow Assembly (RPBA), Pressure Vacuum Breaker (PVB) or Air Gap (AG) installed on the system.  
**Note: PVB shall be installed in such a manner as to isolate the irrigation system from the potable domestic water supply.**
5. Lawn sprinkler systems on reclaimed water do not require a Backflow Prevention Device unless it has a chemical injection system, a Reduced Pressure Backflow Prevention Assembly (RPBA) would then be required.
6. Swimming pools, fountains, or ponds shall require an Air Gap (AG) when filling.

TYPICAL BACKFLOW PREVENTION DEVICES & DESCRIPTIONS			
<u>TYPE AND APPLICATION</u>	<u>TYPICAL DESCRIPTION</u>	<u>APPLICABLE INSTALLATION</u>	<u>STANDARDS</u>
<b>DOUBLE CHECK VALVE ASSEMBLY</b> For <u>low hazard</u> applications	Two independent check valves supplied with ball type or resilient seated shutoff valves and ball type test cocks.	All cross-connections subject to backpressure where there is a low potential health hazard or nuisance. Continuous pressure	A.S.S.E. 1015 A.W.W.A. C506 FCCCHR OF USC
<b>DOUBLE DETECTOR CHECK VALVE ASSEMBLY</b>	Double check valve assembly with a water meter and double check in by-pass line.	Fire protection system supply main. Detects leaks and unauthorized use of water	A.S.S.E. 1015 A.W.W.A. C506 FCCCHR OF USC
<b>RESIDENTIAL DUAL CHECK BACKFLOW PREVENTOR</b> For <u>low hazard</u> applications	Two independent check valves. Checks are removable for testing.	Cross-connections where there is a low potential health hazard and moderate flow requirements.	A.S.S.E. 1024
<b>BACKFLOW PREVENTOR WITH INTERMEDIATE ATMOSPHERIC VENT</b> For <u>low hazard</u> cross-connections. Small pipe sizes.	Two independent check valves with intermediate vacuum breaker and relief valve	Cross-connection subject to back-pressure or back siphonage where there is a low health hazard. Continuous pressure.	A.S.S.E. 1012
<b>LABORATORY FAUCET AND DOUBLE CHECK VALVE WITH INTERMEDIATE VACUUM BREAKER</b> In small pipe sizes for <u>low hazards</u> .	Two independent check valves with intermediate vacuum breaker and relief vent.	Cross connections subject to backpressure or back-siphonage where there is a low health hazard.	A.S.S.E. 1035



TYPICAL BACKFLOW PREVENTION DEVICES & DESCRIPTIONS			
<b><u>TYPE &amp; APPLICATION</u></b>	<b><u>TYPICAL DESCRIPTION</u></b>	<b><u>APPLICABLE INSTALLATION</u></b>	<b><u>STANDARDS</u></b>
<b>REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER</b> For high hazard cross-connections.	Two independent check valves with intermediate relief valve. Supplied with ball type shutoff valves and ball type test cocks.	All cross-connections subject to backpressure where there is a high potential health hazard from contamination & continuous pressure.	A.S.S.E. 1013 A.W.W.A. C506 FCCCHR OF USC
<b>ATMOSPHERIC VACUUM BREAKER</b> For high hazard cross-connections.	Single float and disc with large atmospheric port.	Cross-connections not subject to backpressure or continuous pressure. Install at least 6" above rim. Protection against back siphonage only.	A.S.S.E. 1001 FCCCHR OF USC
<b>PRESSURE TYPE VACUUM BREAKER</b> For high hazard cross-connections.	Spring loaded single float and disc with independent 1 <sup>st</sup> check. Supplied with ball type shutoff valves and ball type test cocks.	This valve is designed for installation in a continuous pressure potable water supply system 12" above the overflow level of the system being supplied. Protection against back siphonage only.	A.S.S.E. 1020 FCCCHR OF USC
<b>HOSE CONNECTION VACUUM BREAKERS</b> For residential and industrial hose supply outlets.	Single check with atmospheric vacuum breaker vent.	Install directly on hose bibs, service sinks and wall hydrants. Not for continuous pressure.	A.S.S.E. 1011
<b>AIR GAP</b> For high hazard cross-connection.	Vertical separation of 2 times the supply pipe diameter above the overflow rim.	All cross-connections subject to backpressure or back siphonage where there is a high potential health hazard from contamination.	A.N.S.I. AI 12.1.2 Vertical Separation Must be @ least 1"

## SECTION 8

### TESTING AND MAINTENANCE OF BACKFLOW PREVENTERS

#### 8.1 General Requirements

As part of a complete Cross-Connection Control Program, it shall be the duty of the property owner/customer user at any premises where Reduced Pressure Principle Backflow Prevention Assemblies (RPBA), Double Check Valve Assemblies (DCVA), and Pressure Vacuum Breakers (PVB) are installed to have a thorough inspection and operational test at the time of installation and at least once a year or more often in those instances where inspections indicate a need. Proper field test procedures with calibrated gauge equipment must be used by certified personnel (reference section 6 for definition and explanation of a Backflow Prevention Assembly Tester - Certified). The cost of testing, maintenance and repair of backflow prevention assemblies shall be the responsibility of the property owner/customer user.

The property owner/customer-user shall be responsible for the cost of the installation, inspection, and testing of any backflow prevention assembly. The costs and any maintenance or repair required as a result of a failed test shall be at the expense of the property owner/customer-user and shall be performed by a certified assembly tester (reference section 6 for definition and explanation of a Backflow Prevention Assembly Tester - Certified).

All assemblies failing to meet the latest performance standards set forth by the American Water Works Association (AWWA 506), American Society of Sanitary Engineers (ASSE 1013), or the Foundation for Cross-Connection Control at the University of Southern California (Manual of Cross-Connection Control), shall be repaired and retested promptly. Assemblies which are found to have a history of not meeting these performance standards should be placed on a semiannual or quarterly testing schedule. Assemblies repeatedly found not to meet the standards are to be replaced with new assemblies. If such testing indicates wear or other malfunction, the assembly shall be overhauled. Such an overhaul should consist of the replacement of all seats, diaphragms, gaskets, etc., which are subject to wear, and any other parts found to be worn or otherwise in questionable condition.

As a prelude to each of the field test procedures, it is essential the certified tester follow some basic steps:

- 1. Notify** Appointment and introduction procedures shall be followed similar to that used for inspections. The owner of the assembly shall be notified the water service will be shut off during the test procedures. Special arrangements may have to be made so interruption of service will not create a hardship on the user.
- 2. Identify** Make sure the proper assembly is being tested by checking identification tag for make (manufacturer), model, and serial number. All information and test data shall be recorded on proper forms before leaving the location.
- 3. Inspect** -Inspect the assembly for the required components for the field test procedure -i.e., upstream and downstream shut-off valves, properly placed test cocks, etc.
- 4. Observe** - Carefully observe area around the assembly for signs of leakage i.e. moss or algae growth, plant life, or soil erosion. This should supply the tester with additional information regarding the condition of the assembly before the test is performed. Example: Wet spot under the relief valve of a Reduced Pressure Backflow Prevention Assembly is an indication of relief



valve activity, possibly from pressure fluctuations or fouling of the assembly. Proper testing will determine the problem.

## **8.2 Parallel Installations**

All backflow prevention assemblies with test cocks are required to be tested with a minimum frequency of once per year. Testing requires a water shutdown usually lasting five (5) to twenty (20) minutes. For facilities that require an uninterrupted supply of water, and when it is not possible to provide water service from two separate meters, provisions shall be made for a "parallel installation" of backflow prevention assemblies.

Multi-story buildings which have a number of flushometer toilets should be equipped with parallel assemblies. Experience has shown if the water supply is shut off to this type of building, flushometers may have to be manually reset.

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

The following list of facilities might require parallel installation of backflow devices:

1. Hospitals, Nursing and Convalescent Homes and Clinics.
2. Multifamily apartments and facilities on one meter.
3. Public or private buildings or any other structures having unprotected cross-connections.
4. Schools, carwash and laundries.

## **8.3 Records**

The Cross-Connection Control Program Manager will notify the customer/user when tests are required. The test forms will be completed and returned to the Cross-Connection Control Program Manager by the date indicated. A full report on the test of each assembly giving pertinent test data and indication what, if any, repairs were made are to be delivered promptly to the Cross-Connection Control Supervisor.

Records are to include, but not be limited to:

1. Reports of inspection, recommendations, re-inspections, and corrective action taken.
2. Correspondence between the Cross-Connection Control Program Manager, customer, health agency, or plumbing official, etc., concerning corrective action.
3. A master list of all backflow protection devices and assemblies in use or proposed for use in the area.
4. Vital data on each protective assembly.
5. Test and maintenance reports for each protective device and assembly.
6. A file system to call to the attention of the Cross-Connection Control Program Manager when testing is due or when re-inspections of premises are needed.

The Cross-Connection Control Program Manager shall utilize a computerized system, if possible, to tabulate all records. Cross-reference of the cross-connection control records with the existing utility billing system may be helpful. As applicable, the Cross- Connection Control Program Manager shall encourage meter readers to perform a cursory inspection of backflow prevention assemblies during their rounds and record their findings accordingly.

#### 8.4 Testers

To ensure continued satisfactory operation of a backflow prevention assembly, testing shall be performed by individuals who are certified and understand the design and intended operation of the assembly (reference section 6 for definition and explanation of a Backflow Prevention Assembly Tester - Certified). A program to train individuals in the testing of backflow preventers is available regionally and nationally. The Cross-Connection Control Program Manager will have the necessary information on how to register and participate in these programs. Only certified assembly testers will be accepted by the Cross-Connection Control Program Manager for fulfillment of customer-user obligations regarding the testing of their backflow prevention assembly.

#### 8.5 Maintenance

Maintenance of backflow prevention assemblies installed on potable or reclaimed systems serving multi-family or commercial developments shall be the responsibility of the property owner. Maintenance of backflow prevention assemblies installed on reclaimed irrigation systems serving single-family dwelling units shall be the responsibility of the property owner. (Refer to section 11.08). The Town of Hilliard will maintain all Residential Dual Check's (RDC) installed by the Town on potable water services of 1" or less serving single family dwelling units.

Maintenance of backflow prevention assemblies and devices, which are exposed and located above ground surface, shall include the protection of such assemblies and devices from the effects of freezing temperatures. This can be accomplished by utilizing a number of methods.

1. Freeze Valves
2. Enclosures
3. Heat Strips
4. Wrapping (use of insulation material)

**Note: When using insulation, caution must be exercised in wrapping the backflow assembly so as not to interfere with the operation of such devices or with its testing. One example of interference is wrapping a Reduced Pressure Assembly (RPBA) in such a way as to interfere with the operation of the relief valve (Preventing water from running freely from the relief valve).**

Backflow prevention assemblies and device shall be maintained in accordance with the recommendations of the assembly or device manufacturer. The painted exterior surfaces of backflow prevention assemblies, including valves and piping, shall be maintained in good condition without evidence of chipping, peeling and other deformation of the coating. Manufacturer labels shall not be painted and remain legible. The color and coating system shall be in accordance with the requirements found in the following table:



## BACKFLOW PREVENTER MAINTENANCE TABLE

SYSTEMS	FIRE	POTABLE	RECLAIMED
1. Shall be painted red.	X		
2. Shall be painted to match the surrounding environment.		X	X
3. Identification tags <b><u>shall not</u></b> be painted.	X	X	X
4. Test cocks <b><u>shall not</u></b> be painted and plugs shall be installed.	X	X	X
5. Shut off valve stems shall be lubricated and exercised <b><u>once</u></b> a year.	X	X	X
6. Identification tag shall be attached as to potable or non potable source.	X	X	X



## **SECTION 9**

### **RESULTS OF NON-COMPLIANCE**

#### **9.1 Discontinued Service**

1. A consumer's Cross-Connection Control Survey report listing all actual or potential cross-connections found during inspection will be sent to the owner or authorized agent of the owner of the building or premises, stating that corrections should be made and setting a time for compliance. Unless otherwise noted in the report, the consumer shall have thirty (30) days to comply and perform any required corrections. Upon failure of the owner or authorized agent of the owner of the building or premises to have the defect (s) corrected by the specified time, the Town of Hilliard Public Works Director shall cause the water service to the building or premises to be terminated and shall take such other precautionary measures deemed necessary to eliminate any danger of contamination of the public's potable water supply system.
2. The Town of Hilliard Public Works Director shall cause discontinuance of water service if a Reduced Pressure Principle Backflow Prevention Assembly (RPBA) has been bypassed or failed to be tested or properly maintained as required by the Town of Hilliard and/or policy statements contained in this manual. Upon discontinuance of service, the Town of Hilliard's Attorney's Office and the Office of the Town of Hilliard's Director of Public Works shall be notified.
3. The Director of Public Works shall cause discontinuance of water service if an Air Gap (AG) separation system is compromised or if, in the opinion of the Director of Public Works, a hazardous condition cannot be immediately corrected.
4. Upon discontinuance of water service for non-compliance with provisions of this Manual, water service to such property shall not be restored until the system has been brought into full compliance.

#### **9.2 Violation Liability**

1. Any person or customer found guilty of violation of any of the provisions of this Manual or any written order of the Town of Hilliard pursuant thereto, shall be punishable in accordance with Section 1-7 of the Hilliard Town Code. In addition, such person or customer shall pay all costs and expenses involved in the case, including attorney's fees.
2. Notice of such violation shall be given by delivery of same to premises and a copy thereof mailed to the billing address as it appears on the Town of Hilliard billing records.
3. Each day upon which a violation shall occur, shall be deemed a separate and additional violation.
4. Any person or customer in violation of any provisions of this manual shall also be liable to the Town of Hilliard for any expense, loss of damage incurred by the Town of Hilliard by reason of such violation to include attorney's fees.
5. In addition to any penalty provided by law, the Town of Hilliard may by suit in the appropriate court to enjoin, restrain or otherwise prevent the violations of any of the provisions of this chapter.

## **SECTION 10 FIRE SYSTEMS**

### **10.1 Backflow Requirements for Fire Sprinkler Systems**

All Fire Sprinkler Systems shall have a minimum of a Double Check Valve Assembly. Fire Sprinkler Systems that have auxiliary water supplies and any type of anti-freeze or any other chemical additives will require a Reduced Pressure Principal Backflow Prevention Assembly.

Note: All backflow preventers will be tested on an annual basis.

### **10.2 Low Pressure Cut-Offs**

All fire pumps drawing suction from the Town of Hilliard water mains shall be equipped with low pressure cut-off devices or other means to prevent the reduction of the Town of Hilliard water main pressure below 20 psi as established by FDEP 62-

555.35 (1) FAC. The fire system designer shall be required to furnish to the Town of Hilliard calculations used to determine the pressure setting of the low pressure cut-off switch.

### **10.3 Special Considerations for the Installation of Backflow Prevention Assemblies on Fire Systems**

Mechanical backflow prevention assemblies need pressure loss to function properly. Before installing an assembly on a fire system, new or existing, this pressure loss should be factored into the system design to ascertain what effect it will have on system performance. Current assembly standards for size 4" through 10" permit pressure loss up to 20 psi for RPBA's and 10 psi for DCVA's and DDCV's. Specific pressure loss information is readily available from all assembly manufacturers.

The manufacturer's installation instructions must be followed to ensure proper operation and to protect the equipment's warranty. No vertical installation of RP's are permitted.

General installation guidelines are as follows:

1. Double Detector Check Valves (DDCV) will be utilized on all Fire Sprinkler Systems whenever possible.
2. The assembly should be installed in a horizontal position and have at least 12" between the bottom of the assembly and final grade or floor.
3. Lateral clearance around the assembly must be provided to facilitate testing, maintenance and replacement.
4. Two assemblies should be installed in parallel for any facility that must have uninterrupted flow during assembly testing or repair (e.g. hospitals).
5. Though not recommended, DCVA or DDVA assemblies may be installed in pits that are well drained; all test ports must be plugged drip tight.
6. If an assembly is installed inside a building, a floor drain is required.
7. Since the relief valve on an RPBA will periodically drip or spit and may dump, the relief

vent may be fitted with a drain line if spillage is objectionable or hazardous (e.g., electrical hazards). The end of the drain line must terminate 12" above ground or flood level and be clearly visible and accessible.

8. The assembly should be protected against freezing.
9. Shut-off valves should be of the O S and Y type, strainers should not be used.
10. The assembled piping should be thoroughly flushed before installing the assembly.
11. The assembly should be adequately supported.
12. Water meters shall not be placed on dedicated fire protection lines.