



# NON-COMPLIANT HOSE BIBB IRRIGATION SYSTEMS

# APEX CROSS CONNECTION CONTROL ORDINANCE

## Town of Apex Cross Connection Control Ordinance Definitions:

### **Permanent Irrigation System**

*Any system supplying dry land with water with means of piping and appurtenances below ground or finish grade which is not readily accessible. Ordinance Sec 12-163 states Lawn Irrigation Systems require a lead-free reduced pressure principle assembly (RP), split tap and water meter.*

### **Cross-Connection**

*Any unprotected actual or potential connection or structural arrangement between a public or a consumer's water system and any other source or system through which it is possible to introduce any contamination or pollution, other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, and other temporary or permanent devices through which or because of which "backflow" can or may occur are considered to be cross connections.*

# HOSE BIBB INFORMATION

A hose bibb is an small outdoor spigot or faucet located on the exterior of the home.



The purpose of the hose bibb is to allow for easy attachment of a hose for water use purposes.

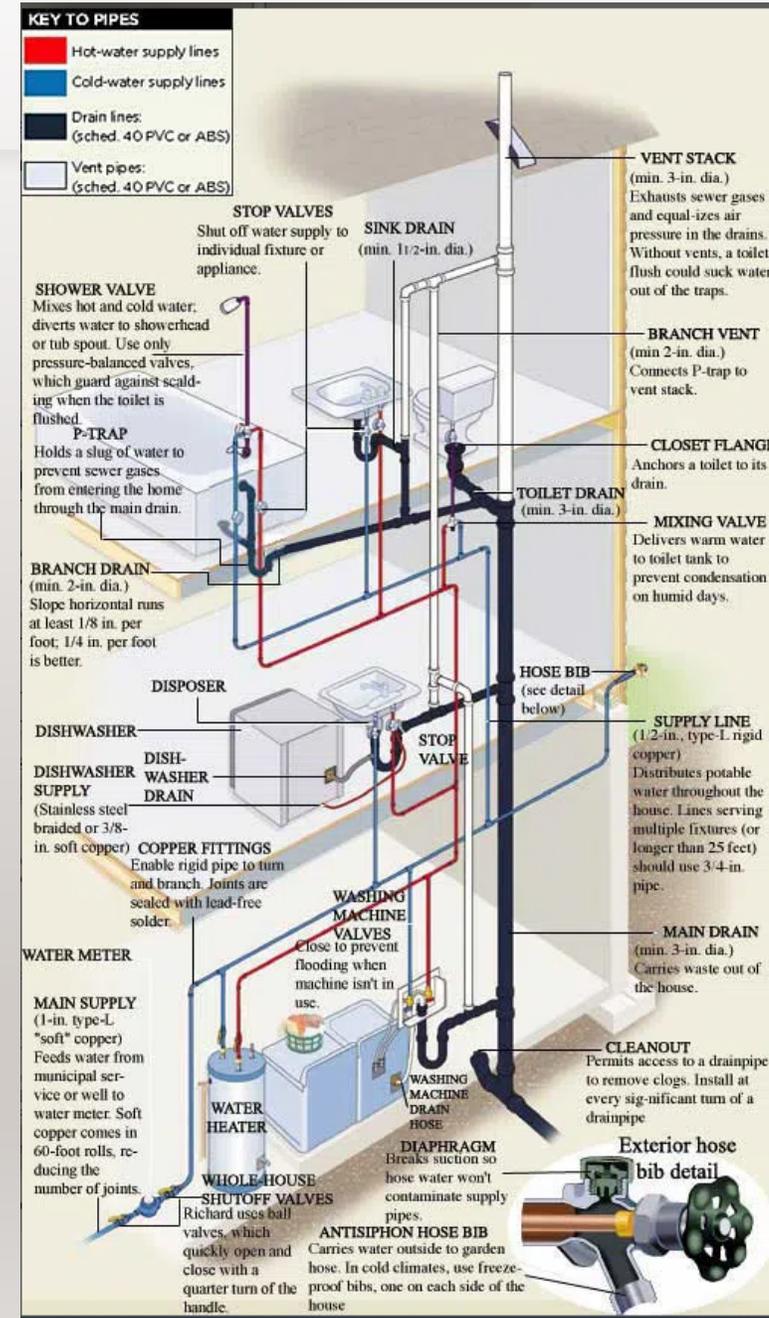


# HOSE BIB INFORMATION

As you can see from the diagram on the right, the exterior hose bib is connected to every fixture inside your home.

- ✓ Toilets
- ✓ Sinks
- ✓ Automatic fed Coffee Makers / Ice Machines
- ✓ Showers
- ✓ Dishwasher
- ✓ Hot Water Tanks
- ✓ Washing Machines

Whatever is or was connected to your hose bib can potentially backflow into your home and contaminate your drinking water and possibly that of the Town's potable water system as well.



# WHAT ARE THE POTENTIAL DANGERS OF HOSE CONNECTIONS?



Hose connections can be extremely hazardous if they are:

- ✓ Submerged in a swimming pool or other container.
- ✓ Attached to a chemical sprayer.
- ✓ Used permanently for irrigation purposes.

A backpressure or backsiphonage event can draw, push, or suck pollutants or contaminants into your home that can cause serious illness or death if you drink, cook, or bath in the contaminated water.

# WHERE DO THE POLLUTANTS/CONTAMINANTS ORIGINATE FROM?

Garden hoses left on top of the ground, buried, or covered with mulch or sod may become contaminated with fertilizer, cesspools, and chemicals.

Sprinkler heads, tubing, piping, etc. are generally points of exit, but can alternately become a point entrance for parasites and / or contamination from animal waste, pesticides, and / or fertilizers if a backflow event were to occur.

*Without adequate backflow protection, a backflow event could easily draw these contaminants into your home and the Town's potable water system.*

# EPA RESEARCH AND PUBLICATION ON CROSS-CONNECTIONS

- **5.4 Occurrence of Cross-Connections and Backflow From a 1999 American Backflow Prevention Association (ABPA) survey**, ABPA estimated that 42 percent of cross-connection surveys conducted (by 135 respondents, representing 30 states) identified a cross-connection. **The most common cross-connections reported were from irrigation (62 percent of respondents identified an irrigation cross-connection), fire systems (43 percent), garden/washdown hoses (43 percent), and boilers (38 percent).** ([EPA reference](#))

## [CDC Article – \(click here to link to CDC reference below\)](#)

Get more information about specific germs and chemicals that most commonly get into water and cause disease, and how to remove them.

### [Germs that can contaminate tap water:](#)

<a href="#">Cryptosporidium</a>	<a href="#">Legionella</a>
<a href="#">Campylobacter</a>	<a href="#">Norovirus</a>
<a href="#">E. coli O157</a>	<a href="#">Rotavirus</a>
<a href="#">Enterovirus</a>	<a href="#">Salmonella</a>
<a href="#">Giardia</a>	<a href="#">Shigella</a>
<a href="#">Hepatitis A virus</a>	

### [Chemicals that can contaminate tap water:](#)

<a href="#">Arsenic</a>	<a href="#">Nitrate</a>
<a href="#">Copper</a>	<a href="#">Radon</a>
<a href="#">Lead</a>	

# PLUMBING CODE AND BACKFLOW PROTECTION

## **NC Plumbing Code 608.15.4.2 Hose Connections.**

Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type or pressure type vacuum breaker or a permanently attached hose connection vacuum breaker.

## **NC Plumbing Code 608.13.6 Atmospheric-type vacuum breakers.**

Pipe-applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASME A112.21.3, ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B642.1, CSA B642.1.1, CSA B64.2.2 or CSA B64.7. **Both types of vacuum breakers shall installed with the outlet continuously open to the atmosphere. The critical level of the atmospheric vacuum breaker shall be set not less than 6 inches above the highest elevation of downstream piping and the flood level rim of the fixture or device.**

**NC Plumbing Code 608.16.5 Connections to lawn irrigation systems.** The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric vacuum breaker, a pressure vacuum breaker assembly or a reduced pressure principle backflow prevention assembly. **Valves shall not be installed downstream from an atmospheric vacuum breaker.** Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly.

# NORTH CAROLINA GENERAL ASSEMBLY 143-355.4

## *All new in-ground irrigation systems require a separate irrigation meter*

### § 143-355.4. Water system efficiency.

- (a) **Local government water systems and large community water systems shall require separate meters for new in-ground irrigation systems on lots platted and recorded in the office of the register of deeds in the county or counties in which the real property is located after July 1, 2009, that are connected to their systems.** This section shall not apply to lots with privately owned septic tanks systems or other types of privately owned innovative on-site wastewater systems if a lockable cutoff valve approved by the water system and a testable backflow prevention device approved by the water system for the appropriate level of risk associated with the irrigation system or other identified risk are installed on the water supply line for the irrigation system. **The lockable cutoff valve shall be installed on the water supply line for the irrigation system within 24 inches of the water meter and the testable backflow device shall be installed on the water supply line for the irrigation system.**
- (b) To be eligible for State water infrastructure funds from the Drinking Water State Revolving Fund or the Drinking Water Reserve or any other grant or loan of funds allocated by the General Assembly whether the allocation of funds is to a State agency or to a nonprofit organization for the purpose of extending waterlines or expanding water treatment capacity, a local government or large community water system must demonstrate that the system:
- (1) Has established a water rate structure that is adequate to pay the cost of maintaining, repairing, and operating the system, including reserves for payment of principal and interest on indebtedness incurred for maintenance or improvement of the water system during periods of normal use and periods of reduced water use due to implementation of water conservation measures. The funding agency shall apply guidelines developed by the State Water Infrastructure Authority in determining the adequacy of the water rate structure to support operation and maintenance of the system.
  - (2) Has implemented a leak detection and repair program.
  - (3) Has an approved water supply plan pursuant to G.S. 143-355.
  - (4) Meters all water use except for water use that is impractical to meter, including, but not limited to, use of water for firefighting and to flush waterlines.
  - (5) Does not use a rate structure that gives residential water customers a lower per-unit water rate as water use increases.
  - (6) Has evaluated the extent to which the future water needs of the water system can be met by reclaimed water.
  - (7) Has implemented a consumer education program that emphasizes the importance of water conservation and that includes information on measures that residential customers may implement to reduce water consumption. (2008-143, s. 9; 2010-142, s. 13; 2010-180, s. 16; 2011-374, s. 3.2; 2013-360, s. 14.21(l); 2017-130, s. 7.)

# PERMANENT IRRIGATION BACKFLOW PROTECTION

An Atmospheric Vacuum Breaker (AVB) and Hose Bibb Vacuum Breaker (HBVB) are **NOT** adequate protection for an in-ground irrigation system because:



1. They cannot be subject to continuous pressure (12 hours or more). The poppet cartridge in the AVB will fail as a result. *For example, if you leave the water on at your hose bibb, but the spray nozzle at the end of the hose is closed it will be under continuous pressure.*
2. They must be 6" above the highest outlet.
3. They cannot have valves downstream.
4. They do not protect against backpressure.

# NON-COMPLIANT LAWN IRRIGATION SYSTEM



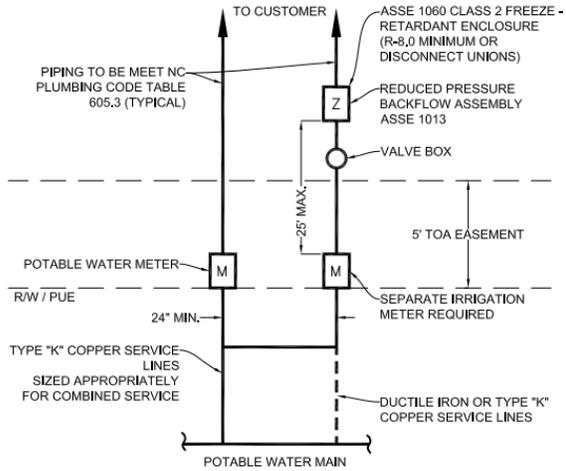
The picture on the left of an in-ground irrigation system is non-compliant with NC Plumbing Code and / or the Cross Connection Control Ordinance because

1. Shut-off valves shall not be installed downstream from an atmospheric vacuum breaker.
2. Hose *Bibb* Vacuum Breaker (HBVB) is not adequate backflow protection against backpressure.
3. Garden hoses are installed underground, which meets the criteria to identify this as a permanent irrigation system. Per the Cross Connection Control Ordinance, permanent irrigation systems require a separate tap, water meter, and a lead-free reduced pressure principle assembly (backflow preventer).

# EXAMPLE OF LEGAL IRRIGATION SYSTEM



# TOWN OF APEX STANDARD DETAILS FOR IRRIGATION SERVICE



## RESIDENTIAL / COMMERCIAL

NOT TO SCALE

### NOTE:

- REDUCED PRESSURE BACKFLOW ASSEMBLY ASSE 1013 SHALL MEET CURRENT TOWN OF APEX CROSS CONNECTION ORDINANCE AND USC CODE.
- INLET PIPE TO WATER METER SHALL BE SAME SIZE AS OUTLET PIPE BEHIND BACKFLOW PREVENTER.
- THERE SHALL BE NO TAPS, BYPASS PIPING, HYDRANTS, FIRE DEPT. CONNECTION POINTS OR OTHER WATER-USING APPURTENANCES CONNECTED TO THE SUPPLY LINE BETWEEN ANY WATER METER AND ITS REQUIRED BACKFLOW PREVENTER.
- EACH BACKFLOW PREVENTER CONNECTED TO TOWN OF APEX WATER SUPPLY (CONTAINMENT) SHALL BE TESTED BY AN APPROVED TESTER BEFORE PLACING THE WATER SYSTEM IN SERVICE AND SHALL BE TESTED ANNUALLY OR AS REQUESTED BY THE TOWN OF APEX.
- IRRIGATION BACKFLOW PREVENTERS SHALL BE INSTALLED OUTSIDE.
- IRRIGATION SYSTEM RAIN SENSORS SHALL BE INSTALLED AND SET TO 1/2" OR LESS.
- ENCLOSURE SHALL HAVE THE FOLLOWING INFORMATION MARKED:
  - NAME OF MANUFACTURER OR TRADE MARK
  - MODEL NUMBER
  - DATE CODE OR SERIAL NUMBER
  - CLASS DESIGNATION AND LOWEST TEMPERATURE RANGE
  - ASSE STANDARD #1060
  - MARKINGS SHALL BE 6 MM (1/4") SIZE LETTER HEIGHT AND CAST, ETCHED, STAMPED OR ENGRAVED ON THE ENCLOSURE, OR ON A CORROSION RESISTANT PLATE SECURELY ATTACHED TO THE ENCLOSURE.
  - 2" SIZE NUMBERS TO BE PLACED ON THE BACK OF THE COVER FOR EACH BACKFLOW LOCATION (COMMERCIAL ONLY).
- ALL BACKFLOW PREVENTERS SHALL BE "LEAD FREE".

TOWN OF APEX  
STANDARDS

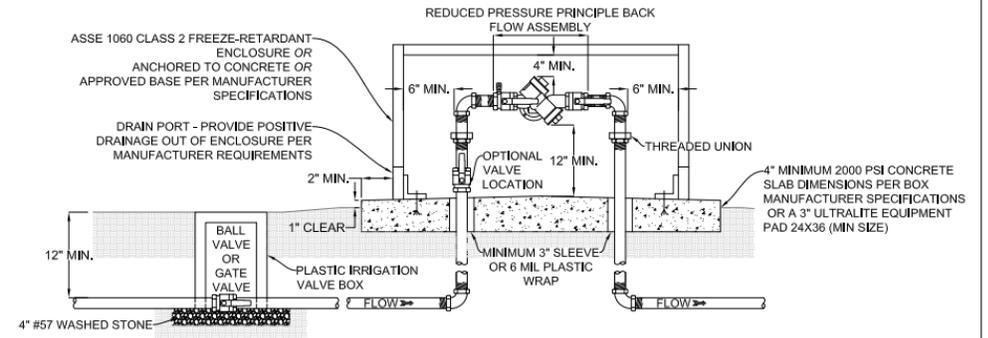
EFFECTIVE: MARCH 6, 2018

SERVICE & IRRIGATION CONNECTIONS

STD. NO.

620.01

SHEET 2 OF 2



### NOTES:

- REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
- BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED PER DRAWING CC-1.01 AND CC-2.01.
- BACKFLOW ASSEMBLY SHALL BE CENTERED ON CONCRETE OR APPROVED BASE PER MANUFACTURER SPECIFICATION.
- ASSE 1060 FREEZE-RETARDANT ENCLOSURE OR DISCONNECT UNIONS WITH TOWN APPROVED ENCLOSURE REQUIRED.
- PIPE MATERIAL SHALL MEET CURRENT NC PLUMBING CODE SPECIFICATION TABLE 605.3.
- INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE TOWN ORDINANCES AND SPECIFICATIONS, USC FCCOHR CODE AND THE NC PLUMBING CODE.
- INSTALLATIONS ARE NOT ALLOWED IN TOWN RIGHT-OF-WAYS, UNDER STRUCTURES OR WITHIN FOUNDATIONS. INSTALLATIONS MUST BE WITHIN 25' OF WATER METER BUT NOT TO EXCEED 10' PAST THE FRONT CORNER OF THE PERMANENT STRUCTURE.
- PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW PREVENTION ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
- ALL BACKFLOW PREVENTERS SHALL MEET CURRENT UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS-CONNECTION AND HYDRAULIC RESEARCH REQUIREMENTS.
- ALL BACKFLOWS SHALL BE "LEAD FREE".

TOWN OF APEX  
STANDARDS

EFFECTIVE: MARCH 6, 2018

3/4" to 2" RESIDENTIAL & COMMERCIAL IRRIGATION  
BACKFLOW ASSEMBLY (OUTDOOR ONLY)

STD. NO.

620.03

SHEET 1 OF 1

# WHAT DO I NEED TO DO TO BECOME COMPLIANT?

You have two options to come into compliance with both the Plumbing Code and the Cross Connection Control Ordinance.

## Option 1 – Disconnect the System

1. Disconnect all timers and valves from the hose bibb and bring all buried hoses, piping, and associated sprinkler/drip appurtenances above grade.
2. Call 919-372-7478 or email [cross.connection@apexnc.org](mailto:cross.connection@apexnc.org) to schedule an inspection of the removed system.

## Option 2 – Disconnect and acquire an Irrigation Permit to bring your system into compliance with existing regulatory requirements.

1. Disconnect all timers and valves from the hose bibb and bring all buried hoses, piping, and associated sprinkler/drip appurtenances above grade.
2. Call 919-372-7478 or email [cross.connection@apexnc.org](mailto:cross.connection@apexnc.org) to schedule an inspection of the removed system.
3. Have a licensed contractor submit an Irrigation Permit to the Inspections & Permitting Department.

A split tap, water meter, and lead-free reduced pressure principle backflow assembly (RP) is required to be installed as part of the Irrigation Permit.

Visit this website

[www.apexnc.org/DocumentCenter/View/19694](http://www.apexnc.org/DocumentCenter/View/19694) to learn more about the Irrigation Permit cost, requirements, and process, and cost.

# COMPLIANCE AND ENFORCEMENT

**Per the Cross Connection Control Ordinance Section 12-160 you have 30 days from notification of a non-compliant notification in which to resolve the issue.**

## **Cross Connection Control Ordinance Sec 12-166 Enforcement.**

- (3) The town may immediately discontinue water service to any consumer if, in the judgment of the town, any consumer or person in charge of any installation
  - a. Is found to be in noncompliance with the provisions of this article and neglects his/her/its responsibility to correct a violation after having been given notice thereof, and such violation constitutes or presents an imminent hazard to the public health, safety and welfare, and/or
  - b. Has a water connection to the town's system that, in the judgment of the town, constitutes or presents an imminent hazard to the public health, safety or welfare.

# QUESTIONS?

Contact:

[cross.connection@apexnc.org](mailto:cross.connection@apexnc.org)

[jessica.sloan@apexnc.org](mailto:jessica.sloan@apexnc.org)

(919) 372-7478