

ORDINANCE TO AMEND CHAPTER 70, ARTICLE VII. - CROSS CONNECTION  
CONTROL

WHEREAS, the City of Durham operates a water supply system that serves the City of Durham and certain surrounding areas; and

WHEREAS, a cross connection allowing non-potable water or other foreign substances to contaminate the drinking water supply presents an imminent health hazard to residential and non-residential users; and

WHEREAS, the public cost of restoring the public water supply after contamination presents the possibility of a substantial financial liability; and

WHEREAS, the City of Durham established and maintains a Cross Connection Control program to control potential sources of contamination of drinking water from cross connections; and

WHEREAS, the Program shall, at a minimum, comply with the Federal Safe Drinking Water Act, the North Carolina Drinking Water Act, the North Carolina State Building Code, and regulations issued thereunder; and

WHEREAS, the Department of Water Management shall promulgate standards that promote the containment and isolation of potential contamination caused by cross connections; and

WHEREAS, the standards may address all activities necessary for operation of the City program; and

WHEREAS, the City has determined that it would be beneficial to clarify some of the definitions applicable to the City's cross connection control program that are contained in the City of Durham Code of Ordinances; now therefore

THE CITY COUNCIL OF THE CITY OF DURHAM ORDAINS:

Section 1. Chapter 70, Article VII, is amended as follows:

ARTICLE VII. – CROSS CONNECTION CONTROL

**(Section 70-578). Purpose**

The purpose of the City of Durham's (the City) Cross Connection Control (CCC) Ordinance is to protect public health and to control cross connections that could allow contaminants or pollutants to enter the City water distribution system via backflow from a customer's water system through connections to the City water distribution system.

This Article outlines the requirements for City of Durham water customers to control cross connections and install and maintain backflow prevention assemblies (BFPA), consistent with

Federal, State, and local regulations. This Article is subject to periodic amendments as laws and industry standards continue to evolve.

**(Section 70-579). Applicability**

This Article applies to all commercial, industrial, non-residential, and multi-family residential service connections with a connection to the City's water system as well as to any persons outside the City who are, by contract or agreement, users of the City's water system. In addition, the CCC Ordinance applies to single-family residences with a connection to the City's water system when a cross connection (e.g., irrigation system, reclaimed water systems, certain residential fire protection systems, make-up lines to swimming pools) is installed at the residence. This article also applies to State and Federal owned properties.

**(Section 70-580). No City Liability**

The provisions of this Article shall not create any liability in the City or City staff members for failure to detect any cross connection, BFPA malperformance, hazard, or contamination of the potable water distribution system.

**(Section 70-581). Federal, State, and Local Requirements**

**A. Federal Requirements**

The CCC Program shall, at a minimum, comply with the Federal Safe Drinking Water Act (1974) and Safe Drinking Water Act Amendments (1986). These Acts state that the water purveyor has the primary responsibility for preventing the introduction of pollutants or contaminants into the public water distribution system. The requirements of this Act, applicable State laws, and other implementing regulations are incorporated into this article as minimum requirements for compliance with the City of Durham CCC Program.

**B. State Requirements**

The CCC Program shall, at a minimum, comply with the North Carolina Drinking Water Act, the North Carolina Building Code, and regulations issued thereunder. The CCC Program shall also comply with North Carolina Administrative Code (NCAC) and NC General Statutes.

**C. Local Requirements**

*CCC Ordinance*

This CCC Ordinance applies to all users connected to the City of Durham's water supply system. The ordinance delegates responsibilities, provides right of entry authority, allocates degree of hazard provisions, assigns testing and repair requirements for BFPAs, delineates facilities requiring containment, issues requirements for connections to unapproved water supply sources, and outlines enforcement criteria. This CCC Ordinance complies with the Federal Safe Drinking Water Act (Public Law [PL] 93-523), the North Carolina State Administrative Code (15A NCAC 08G), Department of Environmental Quality (DEQ) Public Water Supply Subchapter 18C, and the North Carolina Building Code (Volume II) (i.e., the

North Carolina Plumbing Code) as they pertain to cross connections within the water distribution system (Sec. 28-231).

### *CCC Policy*

The City of Durham *CCC Policy* (i.e., the Standards) are written requirements initially approved by City Council, and subsequently maintained by the Department of Water Management and the City of Durham Code of ordinance Section 1-16 – Reference guide for development that meet, at a minimum, the requirements of the Federal and State regulations.

The policy outlines BFPA installation requirements, requirements for issuing connections to unapproved water supply sources, the permitting process, specific backflow prevention requirements for fire protection systems, and the criteria for enforcement.

### **(Section 70-582). Definitions**

The following definitions shall apply to this Article:

- **“A” Class Certified Tester** – Issued to fire sprinkler contractors licensed by the State of North Carolina (NC) for the purpose of testing any backflow preventer and limited to installation, cleaning, repairing, and/or replacing only fire protection backflow preventers. Testers may be included on the City of Durham’s Certified Testers list.
- **Accessible (Access to)** – Capable of being reached for testing and maintenance; however, it first may require the removal of an access panel, door, dirt, sod, or similar obstruction.
- **Administrator** – CCC Administrator; the official in the Department designated by the Director to perform certain functions regarding administration of the City's CCC Program.
- **Air Gap** – 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” shall be at least twice the diameter of the supply pipe measured vertically above the flood-level rim of the receiving vessel, in no case less than 1 inch (2.54 centimeters [cm]). An air gap is the only absolute method for preventing backflow, however it is the easiest to alter or breach.
- **Approved** – Meeting the Standards for cross connections or certified in writing as acceptable by the CCC Administrator, provided that such certifications do not contradict the Standards.
- **Approved Backflow Prevention Assembly (BFPA)** – An assembly that has been approved for use by the Department of Water Management [DWM] CCC Group. Approval of a BFPA includes the approval of shut-off valves (SOV) and test cocks (TC) (and is in-line testable).
- **Atmospheric Vacuum Breaker (AVB)** – A device that prevents backsiphonage by creating an atmospheric vent when there is either negative pressure or sub-atmospheric pressure in a water system; it includes those devices permanently attached to a hose bibb (e.g., hose bibb vacuum breaker [HBVB]). (e.g. ASSE 1001).

- **Auxiliary Intake/Water** – Any water supply on or available to a Consumer’s property other than the City’s approved public potable water supply. Auxiliary waters may include water from another purveyor or any natural source (e.g., well, spring, any unknown water source).
- **“B” Class Certified Tester** – Issued to personnel who are employed and work at a facility owned by their employer for the purpose of testing BFPAs on their premises only; and testers, without contractor licenses, who test in other jurisdictions. BFPA testing is authorized under this class. No internal cleaning, repair, or replacement work is authorized.
- **Backflow** – The undesirable reversal of flow of a liquid, gas, or other substance in a potable water distribution piping system at a cross connection.
- **Backflow Permit** – A document issued by DWM that authorizes a particular action or use of a particular BFPA or another device.
- **Backflow Preventer (BP)** – An assembly, device, or method that prevents the backflow of water into potable water supply systems. (Note: The definitions of specific backflow preventer types provided in the American Water Works Association [AWWA] Manual of Water Supply Practices M14: *Recommended Practice for Backflow Prevention and Cross Connection Control* are adopted by reference, including subsequent amendments and editions.)
- **Backpressure** – A form of backflow where the pressure in the User's water system is greater than the City's water distribution system pressure which can cause a reversal of the normal direction of flow (e.g., booster pumps, lawn irrigation, equipment that allows for extreme temperature increases [e.g., boiler], elevation differences).
- **Backsiphonage** – A form of backflow due to the supply line pressure falling below atmospheric pressure (14.7 pounds per square inch [psi] at sea level) or a reduction in system pressure resulting in sub-atmospheric pressure in the water system. (e.g., water line flushing, firefighting, breaks in the water mains).
- **Bypass** – Any arrangement of pipes, plumbing, or hoses that divert flow around an installed backflow device (BPD) or BFPA through which the flow normally passes.
- **“C” Class Certified Tester** – Issued to contractors (i.e., plumbing and utility contractors) licensed by the State of North Carolina for the purpose of installing, cleaning, testing, repairing, removing, or replacing any BFPA. Testers may be included on the City of Durham’s certified testers list.
- **CCC Administrator** – Staff within the City of Durham responsible for the implementation and enforcement of the CCC Program as defined by this article and the Standards.
- **CCC Policy** – The written requirements approved by the Durham City Council, and maintained by the Department, in the City of Durham Reference Guide for Development, paper and online, that meet, at a minimum, the Federal, State, and local cross connection control regulations (see the definition for Standards).
- **Certified Tester** – A person who meets minimum requirements for “A” Class Certified Tester, “B” Class Certified Tester, or “C” Class Certified Tester which include successful completion of a training program approved by the DWM Director and performance of work that meets standards outlined in the *CCC Policy* document.

- **City** – City of Durham
- **Commercial Property** – Property that includes office buildings, industrial facilities, institutional facilities, medical centers, hotels, retail stores (including malls), farmland, multi-family housing (e.g., apartment complexes, condominiums), warehouses, and commercial garages. Refer to the definition of Non-Residential.
- **Consumer** – Any person, firm, or corporation responsible for any property at which water from the City’s water distribution system is received. In the absence of other parties or failure of the other parties to accept responsibilities herein set forth, the owner of record shall be ultimately responsible.
- **Containment** – When backflow preventer(s) (BP) are installed downstream of the primary water meter and before any branching or point of use connections to contain any contaminants in the consumer’s system from backflowing into the City’s water distribution system.
- **Contamination** – The introduction of or any substance that negatively impacts the quality of water supplied by the City presenting a hazard to public health (e.g., severe illness or death).
- **Contractor** – An individual, firm, or corporation that undertakes a contract to provide materials or labor to perform a service or do a job.
- **Customer** – See definition of Consumer.
- **Cross Connection (CC)** – An actual or potential physical connection between any part of a water system and any other environment containing other substances in a manner that under certain circumstances allow such other substances to enter the potable water system. Other substances may be gases, liquids, or solids. Other substances may be 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 potable water. Cross connections include, but are not limited to, bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur.
- **CCC Group** – City of Durham employees in the CCC Program that are responsible for the implementation and enforcement of this article and the Standards.
- **CCC Program** – A program to eliminate, monitor, protect, and/or prevent unprotected cross connections from allowing backflow.
- **Dead End Lines** – A water line extending more than 50 feet from the City’s water main.
- **Department** – City of Durham Department of Water Management
- **Device (BPD)** – A backflow prevention mechanism only, not in-line testable.
- **Director** – City of Durham Department of Water Management Director
- **Drinking Water Supply System** – The piping that distributes potable water supplied by the City. (Note: The system on the street side of the water meter is the “City’s Water Distribution System.” The system on the User’s side of the water meter is the “User’s Water Supply System.”)
- **Double Check Detector Assembly (DCDA)** – A specially designed BFPA composed of a line-sized-approved DC with a bypass containing a specific water meter and an

approved DC; the meter shall register accurately for only very low flow rates up to 3 gallons per minute (gpm) and shall show a registration for all rates of flow; this assembly shall only be used to protect against a *Low Hazard (Non-Health/Moderate)* (i.e., pollutant). (e.g. ASSE 1048).

- **Double Check Valve Assembly (DC)** – 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 a *Low Hazard (Non-Health/Moderate)* (i.e., pollutant). (e.g. ASSE 1015).
- **Dual Check Valve Device (DuC)** – A device that contains two spring-loaded, independently operating check valves in series, without tightly closing shut off valves and test cocks (e.g. American Society of Sanitary Engineers [ASSE] 1022, 1024).
- **Employees Exempted from Licensure** – An unlicensed person who is directly and regularly employed in the ordinary course of business by a contractor licensed pursuant to General Statute 87, Article 2.
- **Fire Line** – A system of pipes and equipment for a fire protection system (FPS) used to supply water for the purposes of extinguishing a fire.
- **Grandfather Clause** – A clause exempting certain obligations from being a requirement affecting enforcement of this ordinance. ***No such clause exists with regards to the CCC Program and protecting the water distribution system.***
- **High Hazard (Health/Severe)** – A substance that can adversely affect human health and safety.
- **Hose Bibb** – An outside spigot or faucet located on the exterior of a building.
- **In-Ground** – Installation below ground or below finished grade, including, but not limited to below concrete, sod, mulch, pine straw, or sand. An in-ground piping system is any in-ground piping, sprinklers, drip tubing, valve, control wiring of 30 volts or less, and associated components, thereby making the in-ground piping not readily accessible (see definition of readily accessible below).
- **Irrigation** – The supply of water to land to assist with vegetative growth (e.g., grass, trees, shrubs, flowers). (See Irrigation System.)
- **Irrigation Contractor** – Any person who, for compensation or other consideration, constructs, installs, expands, services, or repairs irrigation systems. An irrigation contractor that is not a licensed plumber may only perform work downstream of an irrigation system backflow preventer.
- **Irrigation System** – All piping, fittings, sprinklers, drip tubing, valves, control wiring of 30 volts or less, and associated components installed for delivery and application of water for the purpose of irrigation.
- **Inspector** – A qualified individual certified through the NC Code Officials Qualifications Board to serve as a code official employed by local and state government.
- **Isolation** – Provides a BP at each cross connection found within the customer’s facility to protect and isolate the water line connected to the potential from the remainder of the facility’s potable water supply.

- **Lock Wing (Valve)**– A type of lockable shut-off valve to isolate an individual tenant of a building that is primary metered. This type of lockable valve is required for potential compliance and enforcement measures.
- **Low Hazard (Non-Health/Moderate)** – A substance that does not affect public health; however, it will affect the aesthetic quality of the water (e.g., taste, odor, color).
- **Manufacturer Air Gap Fitting** – An unobstructed fitting that provides an air gap and allows for the connection between the water outlet relief valve of an approved reduced pressure type backflow preventer and indirect waste to convey normal discharge and nuisance spitting, ASME A112.1.3. An approved manufacturer air gap fitting shall be sized properly based on the outlet size of the relief valve.
- **Meter** – A device for measuring the number of gallons or cubic feet of water which passes through a pipe.
- **Primary Meter** – A meter used to measure, for billing purposes, the total amount of water used in an entire building, including combined use from individually leased, rented, or owned units and all common areas.
- **Non-Potable Water** – Water of questionable quality that is not approved for drinking.
- **Non-Regulated Public Water System** – A system for the provision of water to the public for human consumption, through pipes or other constructed conveyances, that serves 15 or more service connections or that regularly serves 25 or more individuals, but to which the scope of Article 10 - North Carolina Drinking Water Act does not apply due to the regulatory exclusion criteria in North Carolina General Statute (NCGS) 130A-314.
- **Non-Residential** – Refer to the definition for Commercial Property.
- **Non-Willful Violation** – An act done without the intent to disregard the applicable federal, state, or City requirements or the Standards.
- **Notice of Violation** – A written notice that a violation has occurred that includes a compliance date to avoid an action to seek penalties or other enforcement action provided to the User or owner of a property.
- **Operator in Responsible Charge (ORC)** – A person assigned by the North Carolina Water Treatment Facility Operators Board (NCWTFOB) who is responsible for the administration of a CCC Program in partnership with the Department and Director.
- **Owner** – A person who owns property.
- **Owner of Record** –The name of the party identified in the City's billing system as the water customer associated with a property or a unit within a property.
- **Plumbing Permit** – A permit required for the installation, extension, or general repair of any plumbing system. (Refer to the North Carolina Administrative Code and Policies.) In Durham, plumbing permits are issued by the Durham City-County Inspections Department.
- **Pollution** – 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. (Also known as a *Non-Health or Low Hazard*.)
- **Potable Water Supply** – Water approved for drinking or another household use (i.e., water that is safe for consumption and aesthetically pleasing).

- **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 backsiphonage; the PVB may not be subjected to any backpressure. (e.g. ASSE 1020).
- **Readily Accessible (Ready Access)** – Access that enables piping, fittings, sprinklers, drip tubing, valves, control wiring of 30 volts or less, and associated components to be directly reached without requiring the removal or movement of any panel, door, dirt, concrete, sod, mulch, sand, or other obstruction similar to those included in this list.
- **Reduced Pressure Principle Backflow Prevention Assembly (RP)** – A BFPA containing an independently operating, hydraulically dependent relief valve located between two independently operating, spring-loaded check valves located between two tightly closing resilient-seated shutoff valves; the RP includes four properly located, resilient-seated test cocks. (e.g. ASSE 1013).
- **Reduced Pressure Principle Detector Backflow Prevention Assembly (RPDA)** – A BFPA composed of a line-size approved RP with a bypass containing a specific water meter and approved RP; the meter shall register accurately for very low flow rates of up to 3 gpm, and shall show a registration for all rates of flow; this assembly may be used to protect against either a *Low Hazard (Non-Health/Moderate)* (i.e., pollutant) or *High Hazard (Health/Severe)* (i.e., contaminant) (e.g. ASSE 1047).
- **Reference Guide for Development**– The reference guide for development shall serve as the technical code or standards applicable to infrastructure construction and development within the city.
- **Residential Property** – Property that is designated as a private dwelling (e.g., single-family home, or duplex); residential properties shall exclude multi-family housing (e.g., apartment complexes, condominiums).
- **Service Connection** – The connection between the City’s water distribution system main and the User’s water system as defined by the NC Plumbing Code.
- **Shut-off Valve (SOV)** – A SOV has a handle that can be used to turn water on or off when it is connected to an inlet water pipe.
- **Spill Resistant Vacuum Breaker (SVB)** – An assembly consisting of an internally loaded check valve and a load air-inlet valve located on the discharge side of the check valve; an inlet and outlet, resilient-seated, fully ported shutoff valve; and a properly located, resilient-seated test cock and vent valve designed to operate under pressure for prolonged periods of time to prevent backsiphonage; the SVB may not be subjected to any backpressure. (e.g. ASSE 1056).
- **Standards** – Written requirements that shall serve as the technical code, issued and maintained by the Department that meet, at a minimum, the requirements of the Federal and State regulation (Refer to §70-581 and the *CCC Policy*), Reference guide for development, and the requirements of this Article of the Durham City Code; the Standards shall be maintained in a document available in paper and online that may bear any title,

including, but not limited to, "manual", "requirements", "guidelines", "reference guide for development", or "policy."

- **User** – Any person that uses the water from the City's water distribution system. Refer to the definition for Consumer.
- **Water Hammer** – a phenomenon that occurs in any piping system where valves are used to control the flow of liquids causing a knocking or shaking sound in the piping.
- **Willful Violation** – An act done voluntarily with an intentional disregard of, or planned indifference to, the Standards.
- **Wye Strainer** – A device that mechanically removes solids from the potable water supply via a perforated or wire mesh strainer.

### **(Section 70-583). General Responsibilities**

#### **A. Department of Water Management (Department) CCC Program Responsibilities**

The Department shall administer the City of Durham's CCC Program, which must address containment and isolation of potential contamination of the potable water supply due to cross connections.

The CCC Program shall, in conjunction with the DWM, set Standards that address both containment and isolation of potential contamination resulting from cross connections. The CCC Program shall ensure that requirements of this Article and the Standards are implemented.

The CCC Program shall also review Building Permit applications and perform plan reviews as they pertain to cross connection and backflow protection. CCC staff shall verify the following prior to issuance of building permits or issuance of Certificates of Compliance (COC) by the Durham City-County Inspections Department:

- a. That the building has the required backflow protection;
- b. That the design of new buildings includes the required backflow protection;
- c. That installed backflow preventers are in compliance with the annual testing requirements of this Article and the Standards.

#### **B. Department of Water Management Director (Director) Responsibilities**

1. The Director shall appoint a CCC Administrator who, along with the Director, is authorized to interpret this Article and the Standards, and enforce the CCC Program.
2. The Director is authorized to enter into agreements (or contracts) delegating oversight of compliance with the City's backflow testing requirements to connected User water systems when the following requirements are met:
  - a. The ORC must be, a NCWTFOCB certified ORC Cross Connection Control System Operator [[15A NCAC 18D.0206 subsection \(d\)](#)] .
  - b. Containment backflow preventers must be installed and maintained at all connections to the City's water distribution system immediately downstream of the water meter and

prior to any branching of the User's water system. The annual reporting of City Code §70-588 must still be met.

- c. Isolation backflow preventers must be installed and maintained at all cross connections downstream of the water meter within the User's/Consumer's potable water system at the point of use. The annual reporting of City Code §70-588 must still be met. Responsibilities of the CCC Administrator (Administrator)

The Administrator will, in conjunction with the Director, interpret this Article and the Standards, and enforce the CCC Program. (A delegated organization (Refer to §70-583.B) shall maintain records for all containment and isolation BFPAs, including the location, type, manufacturer, model, size, serial number, and hazard of each BFPA. All tests and maintenance records for each BFPA shall be available to the City for audit and inspection upon request.)

## **C. Responsibilities of the User**

### **1. Existing Conditions**

- a. Users shall not allow:
  - i. Contamination of the City's water distribution system
  - ii. The creation or use of a cross connection that is prohibited under this Article
- b. Users shall:
  - i. Eliminate all unprotected cross connections that are prohibited under this Article.
  - ii. Install one or more approved BFPAs for those cross connections requiring BFPAs under this Article within the time frames established under the Standards.
  - iii. Bear all responsibility and cost for the installation, testing, maintenance, cleaning, repair, replacement, relocation, inspection, and permitting of BFPAs required under this Article and for all associated plumbing work.
  - iv. Ensure installers and testers hold the appropriate licenses as required by the North Carolina State Building Code and City of Durham Code of Ordinances.
  - v. Maintain BFPAs and ensure all BFPAs are functioning properly by the deadline established by the CCC Administrator.
  - vi. Ensure all BFPAs are tested and results of operational tests are submitted using the City's designated electronic reporting system managed by the currently contracted vendor as published at [www.durhamnc.gov](http://www.durhamnc.gov). Required reports including failures, to the City of Durham, via the City's designated electronic reporting system shall be submitted by the deadline established by the CCC Administrator.
  - vii. Ensure that all non-residential properties have domestic containment.
  - viii. Ensure that all properties have isolation backflow protection in compliance with all applicable codes.
  - ix. All tests and maintenance records for each BFPA shall be available to the City for audit and inspection upon request.
  - x. Ensure that all backflow prevention assemblies are protected against freeze damage. No Backflow shall be installed in a manner by which it is subject to

freezing. Systems such as lawn irrigation may be installed with unions and an upstream, shut-off valve not subject to freezing.

## **2. Notification of Property Change**

- a. Use Change – Users shall notify the CCC Administrator regarding any changes in the use of a property. The CCC Administrator will determine if changes to the cross connection protection (i.e., BFPAs) are required based on the change.
- b. Ownership Change – Users shall notify the CCC Administrator, or the City's designated electronic reporting system regarding any changes in the ownership of a property. The CCC Administrator will determine if changes to the cross connection protection (i.e., BFPAs) are required based on the change.

## **3. Installation of Backflow Prevention Assemblies**

- a. Installation of BFPAs shall be performed by persons with the appropriate licenses as required by the North Carolina Administrative Code and the North Carolina Building Code.
- b. Person performing the work shall be defined as an employee in accordance with 21 NCAC 50.0512 of a company holding the proper licenses.
- c. The Department may require permits for BFPA installation, replacement, relocation, removal, (and other required applications under this Standard. Users shall obtain required backflow, plumbing, and/or fire protection system permits that are required prior to BFPA installation.
- d. Initial testing shall not be performed using a jumper or by-pass around a missing meter.
- e. All BFPA installations shall be completed in accordance with established Standards.
- f. All BFPA installations shall have an approved shut-off valve installed upstream of each backflow, excluding fire protection, in accordance with the NC Plumbing Code section 606.2.
- g. All BFPA installations shall have an approved wye mesh strainer installed upstream of each backflow, excluding fire protection, in accordance with manufacturer recommendations. The strainer provided in a pressure reducing valve is not an approved wye mesh strainer.
- h. All backflow preventers are to be installed in manner where they will not become submerged. All BFPA shall have positive drainage with adequate gravity drainage to atmosphere, not pumped.

## **4. Compliance Deadlines**

- a. A user that has not met the minimum testing requirements for annual testing as described in Code §70-588(B) by the established deadline shall be in violation of this code.

- b. A user that has received a notice as described in §70-591, shall comply with the requirements. If the notice requires the installation of an approved BFPA or requires the removal of an unprotected cross connection, and an imminent danger to the water system or to public health does not exist, the User shall take the required action within 60 days from the date that the notification is deemed received, as described in Code §70-591.
- c. If the CCC Administrator has determined that an imminent danger to the water system or to public health exists, a shorter compliance time may be specified in the notice.
- d. In cases that do not present an imminent danger to the water system or to public health, the CCC Administrator may extend the time for compliance for up to an additional 30 days if compliance efforts are underway and continuing, and the existence of a hardship or special circumstances can be demonstrated. The extension shall only be valid if it is provided in writing and signed by the CCC Administrator.
- e. All BFPAs shall be tested and results submitted, including failures, to the City of Durham, via the City's designated electronic reporting system by the deadline established by the CCC Administrator.

## **5. Failure to Comply**

A User that fails to comply with a notice issued by the CCC Administrator, or with the deadlines described in Code § 70-583.D.4 will be in violation of this Article.

## **D. Responsibilities of an Inspector**

Cross connection inspectors are required to inspect properties served by the City's water distribution system on such a schedule as set by the CCC Administrator to:

1. Identify protected, unprotected, and underprotected CCs to determine compliance with regulations;
2. Provide a detailed inspection summary to ensure compliance with Standards;
3. Determine the hazard level (High or Low) of cross connections and required BFPAs;
4. Inspect installed BFPAs to determine if there are problems with the installation; and
5. Perform inspections per the NC Building Code and the City Code and Standards, and enter accurate notes into the City's designated electronic portal.

As a condition of continued City water service, the Cross Connection inspectors shall have the right to enter, at any reasonable time, any property connected to the City's water distribution system for the purpose of performing the duties of this Article. Refusal of entry may result in the termination of water service. No person shall interfere with a Cross Connection inspector in the performance of the activities authorized by this Article.

## **E. Responsibilities of a Tester**

Responsibilities of certified backflow testers include:

1. Testing installed BFPAs at the time of installation, at least annually, after repairs, after cleaning, after relocation or replacement, and when responding to a reported backflow incident.
2. Maintaining required certifications and licenses to test BFPAs in the City of Durham as required by State law and the City Code and Standards.
3. Tester Ethics and Code of Conduct
  - a. Testers shall not falsify any data or results obtained from field tests performed by the Tester.
  - b. Testers shall not sign or submit any test reports to the City of Durham if the tester did not personally perform BFPA test.
  - c. Testers shall not make any unneeded repairs, replacements, not repair BFPAs with any part not specifically designed for the BFPA being repaired.
  - d. A Tester shall not remove, straight-pipe, or bypass any BFPA that would create an unprotected cross connection.
  - e. A Tester shall not perform a test using water through a bypass or jumper around a meter.
  - f. A Tester shall perform tests using City of Durham-Specified Test Procedures only (Vertical Sight Tube or Differential Pressure Gage, short downstream tube, compensating tee and bleed off valve). A copy of these test procedures will be provided to all City of Durham Approved Testers upon request. Furthermore, Testers will verify all components required for field-testing are present (i.e., inlet and outlet shut off valves, all test cocks). Any discrepancies shall be listed on the Testing and Maintenance Report.
  - g. Following the installation of a new BFPA, Testers are required to submit the appropriate Testing and Maintenance Report to the City of Durham prior to scheduling the Cross Connection Control Backflow Permit inspection.
  - h. The Tester shall also provide a copy of their test results to the customer or tenant upon completion of the procedure.
  - i. For existing BFPAs, Testers are required to submit the appropriate Testing and Maintenance Report, both passing and failing to the City of Durham, via the City's designated electronic reporting system no later than the established deadline set by the CCC Administrator. In addition, the Testing and Maintenance Report shall be submitted to the City by the deadline or within five (5) calendar days of the date the test is performed, whichever is more stringent. If test reports are received more than five (5) days after the date of test, they will not be accepted, and the Tester will be required to re-test the BFPA in question and submit the form within the required period. The Tester shall also provide a copy of their test results to the customer or tenant upon completion.
  - j. Tester shall be employed in accordance with [21 NCAC 50 .0512 EMPLOYEES EXEMPTED FROM LICENSURE](#).
  - k. It is the responsibility of all City of Durham approved backflow testers to maintain their testing equipment, including differential pressure gauges which shall be checked per manufacturer specifications at least once annually.

- i. A tester is required to observe, verify, and record the make, model, size, serial number, and location of all BFPAs while performing a field test.
- m. A tester shall recognize the degree of hazard present when testing an BFPA, and if the BFPA is not adequate to safeguard the degree of hazard, the tester shall test the BFPA and notify the CCC Administrator of the inadequate protection. If the BFPA is installed in a manner inconsistent with existing City of Durham Code requirements or Standards (in a ceiling, PVC, etc.), a Tester is required to note that discrepancy on the Test and Maintenance Report.

Any tester failing to conform to the provisions of this Article or the *Tester Ethics and Code of Conduct* will be in violation of this Code and will be subject to loss of testing privileges within the City of Durham's water system jurisdiction. Loss of testing privileges in Durham will result in notification to the approved reciprocal testing entities in NC.

### **(Section 70-584). Standards**

The City of Durham shall promulgate Standards that control actual or potential cross connections, and that promote the containment and isolation of potential contamination caused by cross connections. The Standards shall be considered requirements of this Article and are incorporated herein. These Standards are contained in the City's *Cross Connection Control* Policy document. Among other things, the Standards shall set forth the types of backflow preventers, including manufacturers and models that are approved for control of backflow from different types of cross connections. Backflow preventers addressed in the Standards shall include the following: air gap, DuC, RP, RPDA, DC, DCDA, PVB, SVB, AVB, and HBVB.

The Standards shall also address other activities necessary for the successful operation of the City's CCC Program, including installation, cleaning, maintenance, removal, relocation, testing, repair, plan review for Building Permit applications, permitting of backflow preventers, permitting of other activities (e.g., fire prevention system installation), and qualifications of Certified Testers.

### **A. Approved Backflow Preventers and Devices**

#### **1. Backflow Device and Assembly Approval**

- a. Only ASSE approved or University of Southern California Foundation for Cross Connection and Hydraulic Research (USCFCCHR) devices or BFPAs will be permitted in the Standards.
- b. An approved backflow preventer shall mean a device or BFPA that has been manufactured in full conformance with the standards established by the ASSE.
- c. BFPAs installed on fire protection systems shall be approved for installation on fire protection systems, be approved by Factory Mutual, and be in compliance with the National Fire Protection Association (NFPA) Code.

#### **2. Manufacturers and Models**

Installed devices or BFPAs shall consist of only those included in the most recent version of the [ASSE International Seal Authorization Booklet](#) or <https://fccchr.usc.edu/list.html>.

## **B. Required Permits**

1. A Plumbing Permit shall be required for the installation of a new BFPA for new construction, renovations, and/or identification of a previously unprotected cross connection. A Plumbing Permit is not required for the replacement of a BFPA if the replacement is with the same type of BFPA (e.g., Replace an existing RP with a new RP) and there are no significant changes in piping; however, the new BFPA must be from an approved manufacturer and an approved model. Refer to §70-584(A)(2) for references listing approved manufacturers and models.
2. Users shall obtain a Backflow Preventer Permit (also referred to as a Cross Connection Control Permit) for the installation, replacement, removal, or relocation of BFPAs prior to starting work.
3. A Fire Protection System Permit is required for the installation of new and replacement BFPAs (other than like-for-like assemblies) on fire protection systems.
4. A Building Permit is required for any inspections, including CCC, for customers seeking a COC.
5. A CCC Plan Review Request application, along with payment of any applicable fees established by the City, shall be submitted in conjunction with the Building Permit application.

## **C. Installation Requirements**

1. BFPAs shall be installed in conformance with the NC Building Code, manufacturer recommendations, and according to details and specifications approved by the Director and ASSE or USFCCHR. The installation requirements shall be described in the *CCC Policy*.
2. Internal components of BFPAs shall be lubricated only with approved, Food and Drug Administration (FDA) lubricants.
3. BFPAs that have been determined through annual or other testing (Refer to §70-588) to require cleaning, repair, or replacement must complete the cleaning, repairs, or be replaced within 15 days following a failing test results.

## **D. Containment**

All non-residential water customers/ users shall have an approved BFPA, as defined in §70-584(A) installed on the potable water supply line, directly after the meter and prior to any tee-offs. This containment backflow isolates the entire property from potentially contaminating the City's water distribution system. Single family residences do not require a BFPA to be installed; however, a backflow prevention device (e.g., a DuC) is required to be installed immediately downstream of the water meter prior to any branches on the User's water system.

## **E. Other Cross Connections (Isolation)**

Cross connections to the City's water distribution system that do not occur at the point of water service or metering (Containment), and cross connections internal to the User's property or facilities require backflow preventers as identified in the *CCC Policy* to isolate an individual

hazard from potentially contaminating the customers internal plumbing system. These cross connections and the approved backflow preventers for these cross connections are described in the Standards.

#### **F. Wye Strainer**

1. An approved wye strainer shall be installed immediately upstream of each installed BFPA, excluding BFPAs in fire protection systems.
2. Wye strainers shall not be installed on fire protection systems, pre-fabricated bulk meters, or fire hydrant meters with backflow preventers issued by the City.
3. All approved wye strainers shall be installed per manufacturer and NC Building Code requirements.
4. The strainer provided in a pressure reducing valve is not an approved wye mesh strainer.

#### **(Section 70-585). Hazardous Connections and Uses**

##### **A. Hazards**

Any connection or use identified in the Standards as requiring a BFPA is deemed hazardous. The City recognizes two levels of cross connection hazards:

1. **High Hazard (Health/Severe)** – Actual or potential threat of contamination that present an imminent danger to the public health, with the potential for serious illness or death. Actual or potential threat of contamination from pumps; tanks or any other containers conveying, storing or otherwise handling sewage, radioactive, lethal, or toxic substances; boiler and steam connections; sewer waste lines; low inlets to receptacles containing toxic substances; coils or jackets used as heat exchangers; bacterial and viral materials; private wells or other private water supply; irrigation systems; irrigation systems interconnected to well water; water systems or hose connections with booster pumps such as fire department connections (FDC) and private hydrants used in conjunction with FDCs; carbonation equipment; or other similar installations with severe hazard potential as determined by the CCC Administrator and approved by the Director, that present an imminent danger to the public health with the potential for serious illness or death.
2. **Low Hazard (Non-Health/Moderate)** – Actual or potential threat that presents foreseeable and significant potential for pollution, nuisance, aesthetically objectionable, or other undesirable alternations to the water supply.

##### **B. Notifying the CCC Administrator of Hazards**

Any person that installs, repairs, replaces, relocates, or inspects any plumbing line that serves a hazardous connection, or that serves a facility that is not equipped with BFPAs as required by this Article and the Standards, shall immediately notify the CCC Administrator of such connections and uses.

Any User that occupies or owns property in which there is a plumbing line that serves a hazardous connection, or that serves a facility that is not equipped with BFPAs as required by

this Article and the Standards, shall immediately notify the CCC Administrator of such connections and uses. (Users shall comply with the requirements of this Article regardless of whether the connection or facility pre-existed the requirements of this Article.)

### **(Section 70-586). Residential and Non-Residential Water Connections**

Users that construct any residential or non-residential building of any type shall include an approved containment backflow preventer near the point of connection to the City's water distribution system, as set forth under the Standards.

Building plans for non-residential buildings that show the locations of plumbing connections, CCs, and uses within each building shall be submitted to the CCC Administrator and approved BFPAs shall be installed as required under the Standards.

The City may refuse water service and/or refrain from issuing of a certificate of compliance if the requirements of this Article and the Standards are not met, in addition to other available remedies.

#### **A. Non-Residential Connections**

1. All non-residential properties as defined in Code §70-582 are required to have an approved, in-line, testable containment BFPA, installed downstream of the water meter and prior to any branching of the User's system.
2. The type of BFPA required for installation for specific non-residential facilities is further defined in the Standards.

#### **B. Residential Connections**

1. All residential properties as defined in Code §70-582 shall have an approved DuC installed immediately downstream of the water meter and prior to any branching of the User's system.
2. The type of BFPA required for installation for specific residential connections is further defined in the Standards.

### **(Section 70-587). Inspections of Backflow Prevention Assemblies**

#### **A. Designated Inspector**

1. CCC Program personnel are designated as cross connection inspectors for the City.
2. A cross connection inspector shall inspect properties served by the City's water distribution system on such a schedule as set by the CCC Administrator.

#### **B. Right of Entry**

1. As a condition of continued water service, cross connection inspectors shall have the right to enter, at reasonable times and upon reasonable conditions any property connected to the City's water distribution system in order to assess compliance with the requirements of this Article.

2. Refusal of reasonable entry requests by CCC Program personnel, may result in termination of City water service.

### **C. Inspection and Testing by the City**

1. The City may inspect and test any BFPA where:
  - a. Written notice has been provided to the User; and
  - b. The User has not provided an approved inspection or test results by the required deadline.
2. The fee for City BFPA inspection and testing, plus an administrative fee, set by the City Council, may be added to the User's utility bill.
3. Refer to Code §70-590 and §70-591 for additional information regarding notices of violation and civil penalty assessment.
4. The City and designated City of Durham staff shall bear no liability for damage resulting from BFPA inspection and testing performed pursuant to this section.

### **D. Interference with Site Survey or Inspections**

The CCC Administrator and City employees designated as inspectors shall inspect properties served by the City water supply system on such schedule as set by the administrator. As a condition of continued water service, and in compliance with NCAC *section 204.2.6 Right of entry*, inspectors shall have the right to enter, at any reasonable time, any property connected to the City drinking water supply system for the purpose of performing the duties of this Article. Refusal of entry may result in termination of water service. No person shall interfere with an inspector in the performance of the activities authorized by this article.

## **(Section 70-588). Testing of Backflow Prevention Assemblies**

### **A. Initial Testing**

1. Installers shall obtain a Cross Connection Control permit (i.e., Backflow Preventer Permit) for the installation, replacement, removal, or relocation of BFPAs prior to beginning work and in accordance with 21 NCAC 50. 0402.
2. Installers shall ensure work is performed in accordance with NC Building Codes, this Article, and the Standards.
3. Installers shall ensure that new installation testing is performed and results are submitted to the CCC Administrator following the installation, replacement, or relocation of a BFPA in accordance with the Standards.
4. Installers shall schedule a CCC inspection to close out the backflow permit in accordance with [21 NCAC 50. 0402](#).
5. Any person that installs a BFPA shall report such actions to the CCC Administrator in accordance with [21 NCAC 50. 0402](#).

6. The CCC Administrator or CCC Inspectors shall inform that person if additional inspection or testing is required. Upon a failed inspection, a retest of the backflow preventer is required after corrections have been made.
7. Installers who fail to report the new installation test results within ten (10) days of the system being made operational or placed into service, shall be in violation of this Article. Refer to §70-589B.

## **B. Annual Testing**

1. The User or Owner of Record shall have all BFPAs tested at least annually or more frequently as may be required by the Standards.
2. Annual BFPA testing shall be conducted by an approved Certified Tester.
3. The Certified Tester shall report the results of the test to the CCC Administrator, via the City's designated electronic reporting system by the established deadline. In addition, test results shall be submitted to the City by the deadline or within five (5) calendar days of the date the test is performed, whichever is more stringent. Submittal process shall be in compliance with the *CCC Policy*.
4. The Certified Tester shall verify and supply all testing information required by the City and the designated electronic reporting system including, but not limited to: test values, size, make, model, serial number, and location of the BFPA, as well as the name and address of owner as recorded on the notice. If any of this information has changed from the initial installation or from the last testing report, the Certified Tester shall email [CCCProgram@durhamnc.gov](mailto:CCCProgram@durhamnc.gov).
5. The Certified Tester shall provide BFPA testing results to the User or Owner of Record upon completion of the testing.
6. Refer to §70-589 and the *CCC Policy* for Certified Tester requirements.

## **C. Other Testing**

1. BFPA testing shall be conducted and submitted to the CCC Administrator when any BFPA is repaired, relocated, or cleaned. The test results must be uploaded to the City's designated electronic reporting system within 5 days of when the test was performed. When replacing a backflow, the test results must be uploaded to the City's designated inspection portal at the time the inspection is scheduled.
2. Any person that removes, repairs, relocates, cleans, or replaces a BFPA shall report such actions to the CCC Administrator within five (5) days of these actions.
3. The CCC Administrator shall inform that person if additional inspection or testing of the BFPA is required above and beyond that required in subsection 1 of this section.
4. If the person who conducted the work fails to make such a report within ten (10) days of the inspection or testing, the certified tester is in violation. Refer to §70-589 B.
5. (All other BFPA testing shall be performed by a Certified Tester as specified in §70-589 and the Standards incorporated herein.
6. The City reserves the right to perform testing in accordance to §70-587.C, Inspection and Testing by the City.

## **(Section 70-589). Certification and Qualification of Testers**

### **A. Certification and Other Qualifications**

1. The Standards shall establish qualifications for Certified Testers, which shall include successful completion of a training program recognized by the Director, as well as, meeting performance standards relating to compliance with this Article.
2. Contact the CCC Administrator or review the City's designated electronic reporting system, for a list of Certified Testers.

### **B. Disqualification of Certified Tester**

A Certified Tester may be disqualified for failure to meet qualifications established by the Department in the *Testers Ethics and Code of Conduct* included in §70-583.F.

1. The Department shall provide written notice to a Certified Tester, mailed or emailed to the address or email address that the Certified Tester has provided to the Department, setting forth the basis for disqualification.
2. Disqualification shall be effective three (3) days after such mailing.
3. The Department shall also provide email notice to the Certified Tester or testing company if the tester has provided an e-mail address.
4. The Department shall provide an opportunity for a Certified Tester who has been disqualified to obtain reconsideration by the Director or the Director's designee upon written request from the tester. The reconsideration request must be received no later than 10 days following the effective date of disqualification.
5. A disqualified tester may not request reinstatement within three (3) years of the disqualification.

## **(Section 70-590). Violation of Ordinance**

### **A. Violation**

A person who fails to comply with this Article, as well as any order, certificate, or permit issued hereunder, or who installs or alters a plumbing system in nonconformance with approved specifications or plans that address CCs or BFPAs regulated under this Article, shall be determined to be in violation of this Article.

### **B. Civil Penalty**

#### **1. Civil Penalty Assessment**

- a. Any civil penalty shall be assessed by the Director and, at a minimum, shall consider the factors identified in [§70-343\(b\)](#).
- b. The Director is authorized to reduce civil penalties previously assessed if compliance has been achieved and reduction appears justified as determined by the Director.

- c. A civil penalty that has become final following the determination process in [§ 70-343\(b\)](#), may be added to a User's or the Owner of Record's water bill, and water service may be terminated for nonpayment.

## **2. Maximum Civil Penalty**

- a. A customer in violation of this Article is subject to a civil penalty, which may be recovered by the City in a civil action if the violator does not pay the penalty within 30 days after the assessment has become final by exhaustion of the appeal process established by this section, or by failure of the customer to appeal the assessment.
- b. The civil penalty for a non-willful violation shall not exceed \$250.00 per day for each day of violation, or a cumulative penalty of \$5,000.00.
- c. The civil penalty for a willful violation shall not exceed \$500.00 per day for each day of violation, or a cumulative penalty of \$10,000.00.
- d. A civil penalty that has become final pursuant to this ordinance may be added to a User's water bill and/or water service may be terminated for non-payment.

## **3. Appeal**

- a. A violator may appeal an assessment of a civil penalty by mailing a written appeal to the Director, including all arguments that support reducing or eliminating the penalty.
- b. The appeal must be received within 18 business days from the date of receipt for the Notice of Penalty. The notice is deemed received pursuant to §70-591(C).
- c. An appeal mailed by first-class mail shall be deemed received three (3) days from the date it is mailed.
- d. The Director or his/her designee shall review the written appeal and penalty and make a final determination, which shall be sent to the violator in accordance with §70-591(B).

### **(Section 70-591). Notice to User of Need for Action, Violation, or Penalty**

#### **A. Notice to Violator**

Upon identification of the potential for pollution, contamination or a hazard to the City's water distribution system, or a failure to comply with any requirement of this Article or the Standards, the CCC Administrator shall notify the user and/or the owner of record of the property at which the potential contamination or hazard exists via first-class mail. The Notice of Violation shall include a description of the location and nature of the potential contamination or hazard, identification of the applicable section of this Article or Standard, and the order of the CCC Administrator regarding actions to be taken in order to return the property to compliance.

The CCC Administrator shall, among other things, determine if there is an imminent danger to the City's water distribution system or to public health. The CCC Administrator's determination shall impact deadlines for compliance as described in §70-583(D)(4). The CCC Administrator may issue any follow-up orders deemed necessary, including orders for testing and other actions related to compliance.

## **B. Communication Standards**

The CCC Administrator shall send a Violator written notice of the civil penalty and the basis of the amount assessed via one of the following methods:

1. Certified mail with a return receipt requested
2. First-class mail
3. Email with read receipt

## **C. Deadline of Receipt**

A Notice of Penalty shall be deemed received three (3) days from the time it is mailed to the owner of record of the property.

## **(Section 70-592). Discontinuance of Service for Violations**

### **A. Procedure**

The Department may discontinue water service to any structure or parcel for a violation of this Article. Prior to discontinuing water service, the Director will provide written notice to the customer as shown on the revenue billing roll and to the Owner of Record, occupant, or other persons in apparent control of the structure or parcel.

The Director is not required to provide written notice prior to discontinuing irrigation water service.

### **B. Service Restoration**

When service is discontinued as described in in §70-592(A), it shall not be reinstated until the CCC Administrator determines that compliance with this Article and the Standards have been achieved. Prior to service restoration, all fees required by the Director for the restoration of water service shall be paid, in addition to any civil penalties assessed as described in § 70-590.B.

### **C. No Liability**

The City and designated City of Durham staff shall bear no liability for damage resulting from the discontinuance of service pursuant to this section.

## **(Section 70-593). Fees**

Fees for the activities authorized under this Article, including fees for manuals, permits, City inspections and re-inspections, City testing, City plan review, City locking or unlocking of water meters, training courses, and tester certifications will be established by the City Council.

**Sections 70-594 – 70-629. Reserved**

Section 2. Amend Chapter 70, Article VII Sections 70-578 through 70-629, effective upon approval by City Council