



Appendix A

Guidelines and Requirements for the Cross Connection and Hydrant Meter Programs



Raleigh
Water

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SECTION 1

GENERAL INSTALLATION REQUIREMENTS FOR CONTAINMENT ASSEMBLIES

1.1 INTRODUCTION

1. The City of Raleigh Public Utilities Department as the water purveyor for Raleigh, Garner, Rolesville, Wake Forest, Knightdale, Zebulon and Wendell has the primary responsibility of protecting the public water supply from potential sources of contamination and/or pollution. All commercial and residential connections to the public water supply are required to be protected with a containment assembly as determined by Part 8-Public Utilities Article D: Water Quality Protection of the Raleigh City Code and the policies and design criteria identified within this document. This document may be appended by technical bulletin or as published by annual updates of this manual.
2. Any references to the North Carolina Plumbing, Fire, or Electrical Code, Raleigh City Code or Public Utilities Handbook shall include subsequent revisions.
3. For any application not specifically mentioned within this document, level of hazard shall be determined by the Raleigh Director of Public Utilities or his designee.
4. No containment assembly shall be installed in a manner as to allow the assembly to be looped around or by-passed either temporarily or permanently. There shall be no taps, piping branches, unapproved bypass piping, hydrants, fire department connection points, or other water using appurtenances connected to the supply line before any containment assembly.
5. Upon identification of the potential for contamination or a hazard to the City of Raleigh's drinking water supply system, or a failure to comply with a requirement of this handbook, the Public Utilities Director or his designee shall notify the owner pursuant to the procedures established in Sec. 8-2151 "Notification of Hazard".
6. For existing commercial facilities with multiple meters, the Cross Connection Coordinator can propose the option to master meter the facility.
7. Raleigh owns and operates the water wastewater and reuse systems within each of these merger communities. The policies listed in this handbook apply to all customers making connections, modifications, or extensions to Raleigh water systems.

1.2 OTHER IMPORTANT NUMBERS

City of Raleigh Inspections Department	919-996-2495
Town of Garner Inspections Department	919-773-4433
Town of Wake Forest Inspections Department	919-435-9530
Town of Rolesville Permits (Wake County Inspections Department)	919-856-6060
Town of Knightdale Permits (Wake County Inspections Department)	919-856-6060

Town of Zebulon Permits (Wake County Inspections Department)	919-856-6060
Town of Wendell Permits (Wake County Inspections Department)	919-856-6060

1.3 DEFINITIONS

As used in this handbook, the following terms shall have the meanings provided in this section unless the context clearly indicates otherwise.:

Air-gap: A physical separation sufficient to prevent backflow between the free-flowing discharge end of the potable water system and any other system. Physically defined as a distance equal to twice the diameter of the supply side diameter but never less than one (1) inch.

Approved enclosure: An enclosure that meets or exceeds ASSE Standard 1060 by being on the agency’s approval list.

Auxiliary intake: Any piping connection or other device whereby water may be obtained from a source other than the City’s public water supply.

Auxiliary water supply: Any water other than the City of Raleigh public water supply as defined herein; including, but not limited to **recycled** water, grey water, rain water, well water, cistern water, reuse water and any other water supply from other water purveyors other than the City of Raleigh.

Backflow: The flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.

Backflow assembly: An inline testable and repairable mechanical arrangement used to protect the public water supply that meets or exceeds standards set forth by the University of Southern California for Cross Connection Control and Hydraulic Research (USCFCCHR) and the American Society of Sanitary Engineering (ASSE) by being on the agency’s approval list. A backflow assembly used on fire suppression systems must have the additional approval of Factory Mutual (FM) and comply with the National Fire Protection Association (NFPA) code.

Backflow device: A mechanical backflow assembly without shut-off valves or test ports and therefore not inline testable.

Backpressure: A condition in which the owner’s system pressure is greater than the supplier’s system pressure.

Backsiphonage: The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

Base Flood Elevation (BFE): A determination of the water surface elevations of the base flood based on current conditions hydrology or future conditions hydrology as published in the flood insurance study. When the BFE has not been provided in a flood hazard area, it may be obtained from engineering studies available from a Federal or State other source using FEMA approved engineering methodologies. This elevation, when combined with 2 additional vertical feet establishes the regulatory flood protection elevation in flood hazard areas.

Building story: A building story is equal to 10’ for the purpose of this handbook.

Certified tester: A person who has proven his/her competency to test and make reports on containment assemblies as evidenced by certification of successful completion of a training program approved by the Raleigh Director of Public Utilities or his designee.

Containment assembly: A backflow assembly installed at the point of separation between the public water supply and a private service or private distribution system or at the point of metering.

Containment protection: A containment assembly installed at the point of separation between the public water supply and a private service or private distribution system or at the point of metering.

Cross-connection: Any actual or potential connection between the public water supply and a source of contamination or pollution.

Cross Connection Coordinator: The official position established and authorized by the City and designated by the Raleigh Director of Public Utilities to administer, interpret this section and who shall be a certified tester and may serve as Operator in Responsible Charge as recognized by North Carolina Department of Environment and Natural Resources 15A NCAC 18D.0701.

Double check valve assembly (DCVA): A type of backflow assembly manufactured pursuant to ASSE Standard 1015.

Double check detector assembly (DCDA): A type of backflow assembly manufactured pursuant to ASSE Standard 1048.

Dual check valve: A type of backflow device manufactured pursuant to ASSE Standard 1024.

Fire line: A system of pipes and equipment used to supply water in an emergency for extinguishing fire.

Interconnection: Any system of piping or other arrangement whereby the public water supply is connected directly to a sewer, drain, conduit, pool, heat exchanger, storage reservoir, or other device which does or may contain sewage or other waste or substance which would be capable of imparting contamination to the public water supply.

Isolation assembly: A backflow assembly required by the NC Plumbing Code that is installed within a private plumbing or distribution system to isolate a localized hazard from the remainder of the private system.

Moderate hazard: A cross-connection or potential cross-connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable if introduced into the public water supply.

Owner: Any person who has legal title to, or license to operate or inhabit, a property upon which a cross-connection inspection is to be made or upon which a cross-connection is present.

Potable Water: Water which is approved for drinking and other household uses and provided by the City of Raleigh Public Utilities Department.

Public water supply: The water and waterworks system of the City of Raleigh and its customers outside the corporate limits, for general use as potable water and which is recognized as the public water supply by the North Carolina Department of Environment and Natural Resources as system number 03-92-010.

Reduced pressure zone principle backflow assembly (RPZ): A type of backflow assembly manufactured pursuant to ASSE Standard 1013.

Reduced pressure detector assembly (RPDA): A type of backflow assembly manufactured pursuant to ASSE Standard 1047.

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

END OF SECTION 1

SECTION 2

IRRIGATION (RESIDENTIAL/COMMERCIAL) CONTAINMENT ASSEMBLIES REQUIREMENTS

Any water fee only service, which is split from the primary domestic service (see detail W-34 and W-35) will be considered an "irrigation service" for the purposes of this policy. This water fee only service may not be used as domestic water and may not enter or cross under any existing or proposed structure. This also applies to water fee only meters, which are installed for irrigation or yard hydrants, car washing, or similar outdoor use shall be protected with a Severe Hazard containment assembly in the form of an RPZ.

2.1 ACCESSIBILITY

1. All containment assemblies must be installed where the Raleigh Director of Public Utilities or his designee deems them readily accessible. Backflow assemblies may not be installed in an inaccessible, hazardous or otherwise unsuitable location, including but not limited to in traffic medians, chemical rooms with corrosive fumes, behind walls, under kitchen or bathroom lavatory cabinets, crawl space, ceilings, drainage areas, side of a hill without level access or working surface, behind vent hoods etc. Readily accessible means having direct access to a containment assembly without the requirement to remove any panel, door or similar covering of the item described, and without requiring the use of portable ladders, chairs, etc. The proper installation of an insulated approved enclosure may be deemed readily accessible. Approved enclosure clearances shall comply with ASSE Standard 1060. Clearances shall allow adequate room for servicing and maintaining the containment assembly in the approved enclosure.

2.2 ALTERATIONS/MODIFICATIONS

1. No containment assembly shall be altered or modified from its approved factory configuration unless such modifications are made with strict adherence to manufacturer's recommendations. All alterations or modifications must be inspected by the Raleigh Director of Public Utilities or his designee.

2.3 APPROVAL OF ALTERNATE INSTALLATIONS

1. When a special circumstance precludes the ability to comply with these requirements, the Raleigh Director of Public Utilities or his designee may approve alternate installations.

2.4 AUTHORIZED TO INSTALL, REPLACE, OR REPAIR

1. Any containment assembly required to be installed by the provisions of this article or by a corrective order issued by the Raleigh Director of Public Utilities or his designee shall be installed by one of the following:
 - A. Licensed Class I Plumber: can install, replace, or repair irrigation, domestic, and fire (outside installations only) containment assemblies for all structures.
 - B. Licensed Class II Plumber: can only install, replace, or repair irrigation, domestic, and fire containment assemblies for single-family residential dwellings.
 - C. Limited Plumbing License: can install, replace, or repair irrigation or domestic containment assemblies of two-inch diameter or smaller.

D. Licensed Fire Sprinkler Contractors: can only install, replace, or repair containment assemblies that are a part of the fire sprinkler system. They cannot install, replace, or repair irrigation or domestic containment assemblies.

E. Licensed Utility Contractor: can install, replace, or repair irrigation, domestic, and fire containment assemblies within 5' of the building.

2.5 APPROVED BACKFLOW ASSEMBLIES

1. A list of approved backflow assemblies can be found on the City of Raleigh's website www.raleighnc.gov or contact the Raleigh Cross-Connection Control Office via email at cross.connection@raleighnc.gov.

2.6 AUXILIARY WATER SUPPLY (RECYCLED WATER, GREY WATER, RAIN WATER, REUSE WATER, IRRIGATION WELL, AND CISTERN)

1. Interconnections between an auxiliary water supply and the public water supply are not permitted and considered unlawful. (Sec. 8-2143) Premises where an auxiliary water supply exists or is installed shall have an approved containment assembly in the form of an RPZ installed on the public water supply service line. (Sec. 8-2147) Make-up water connections to an auxiliary water supply including but not limited to cisterns, grey water, rain water, reuse water, recycled water, and irrigation well systems shall have a containment assembly in the form of an approved RPZ and an air gap installed on the public water supply service line. Any unapproved interconnection between an auxiliary water supply and a public water supply shall be corrected according to City of Raleigh's Article D: Water Quality Protection and NC Plumbing Code 606.6 Cross-connection control.

2. Residential owners desiring to install or maintain a well must install a containment assembly in the form of an RPZ on their domestic water service unless all auxiliary plumbing connections are completely isolated outside of any structure accepting a public water supply. RPZs must be tested annually at the customer's expense. Water meters will not be installed on dual plumbing systems until the Raleigh Director of Public Utilities or his designee receives confirmation from the local plumbing inspector or the Authority Having Jurisdiction (AHJ) that all the potable and auxiliary systems are not interconnected and the auxiliary system piping is marked non-potable.

2.7 DRAIN REQUIREMENTS

1. RPZ containment assemblies are not allowed to be installed below ground level. RPZs installed in above ground approved enclosures shall be installed so that the relief outlet of the assembly does not become submerged. A minimum clearance of 12" must be maintained from the most bottom part of the assembly to concrete pad or floor. Drain size is a minimum of 4" or two times the size of the containment assembly whichever is greater and provide positive drainage with adequate gravity drainage to atmosphere.

2.8 ENCLOSURES

1. Any RPZ Irrigation containment assembly:

A. Minimum non-heated, insulated Class II, approved enclosure. Containment assembly is to be drained during winter months. Approved enclosure to be mounted on a concrete pad, fiberglass, or approved mounting pad. OR

B. The containment assembly for a lawn irrigation system may be removed for winterization when installed with unions and an upstream shut off valve not subject to freezing.

C. Consumer is responsible for protecting the containment assembly from freezing.

2. If multiple containment assemblies are installed within one approved enclosure, all components of each containment assembly must be accessible for testing, repair and or replacement without having to remove another containment assembly or piping that serves another assembly. The test ports to all containment assemblies must be accessible. Approved enclosures that are damaged and do not provide adequate freeze protection may be required to be repaired or replaced.

2.9 FLOOD PRONE AREAS

1. Containment assemblies installed in a flood plain must be installed at base flood elevation.

2.10 IDENTIFICATION TAG

1. No manufacturer's tag or stamp that bears pertinent information shall be removed from the unit. If a manufacturer's tag or stamp is removed or damaged and rendered unreadable and the containment assembly is an approved model, the containment assembly must be marked with the original serial number or issued a new number by the Cross Connection Program

2.11 LOCATION

1. Lawn irrigation containment assemblies must be installed no more than 50 linear piping feet from the most downstream edge of the meter box unless prior written approval for an alternative location is granted in writing by the Raleigh Director of Public Utilities or his designee. (See Section 8: Exception for Location). The containment assembly must remain accessible and visible after landscape maturity. Containment assemblies may not be installed in a hazardous location, traffic site triangle or within the right-of-way (ROW).

2.12 MATERIALS

1. Piping materials shall conform to one of the standards listed in NC Plumbing Code Table 605.3 for water service pipe and 605.4 for water distribution pipe.

2.13 PERMITS

1. A plumbing permit is required for all new and relocated containment assembly installations. Assemblies to be replaced where the piping configuration will not be changed or modified are not required to have a permit for installation. The receipt of a plumbing permit does not relieve the owner of compliance with all applicable Cross Connection rules and regulations.

2.14 PRE-EXISTING ISSUES

1. Any approved containment assembly that has not been installed in accordance to Sec. 8-2149 of Raleigh City Code and whose location does not pose an imminent threat to the public water supply shall be considered pre-existing and compliant.

2.15 RELIEF OUTLET PIPING AND VALVE

1. In some applications, it is practical to install a drain line off the relief port of the RPZ assembly so that in the event that there is some spillage from the device the water can be directed to a floor

drain. When drains from the relief port of an approved containment RPZ are utilized, the following conditions must be met:

- A. An approved pre-fabricated "air gap drain" as available from the backflow assembly manufacturers must be utilized.
- B. All relief port drain lines shall be piped to an outside point of termination.
- C. The RPZ relief valve shall be a minimum of 12" above any material or ground.

2.16 REPAIRS

1. If a containment assembly fails its operational test, the property owner will have 45 days from the date of notification to have all repairs made except those owners of properties with a cross-connection, auxiliary intake, interconnection or severe hazard as defined by Article D: Water Quality Protection and Appendix A: Guidelines and Requirements for the Cross Connection and Hydrant Meter Programs that is deemed, by the Cross Connection Coordinator, to be an imminent threat shall install a containment assembly required by the Raleigh City Code immediately. Failure to install the appropriate containment assembly within 15 days where there is an imminent threat, may result in the discontinuance of water service until such violations are corrected. Defective parts must be replaced with factory approved parts. If repair is not possible, the assembly must be replaced with an approved RPZ backflow assembly according to the Raleigh City Code, Public Utilities Handbook, and North Carolina Plumbing Code.

2.17 SERVICE VALVE

1. The #1 shut-off valve is part of the containment assembly and may not be used as a service valve. A service valve shall be installed after the meter, outside of the ROW, and prior to every containment assembly to allow testing, maintenance and replacement of the containment assembly without the use of a City of Raleigh Public Utilities operating valve. The service valve shall be installed underground and a minimum of 18" distance from the meter.

2.18 SUPPORT

1. Containment assemblies shall be properly supported so that stress on surrounding piping does not occur. Adequate support must be provided for the assembly in the approved orientation either vertically or horizontally. The assembly may not be supported by other piping or unapproved methods of support. (See: North Carolina Plumbing Code Section 308.5)

2.19 TESTING

1. All residential irrigation containment assemblies are to be tested by June 1st every three years. Containment assemblies on commercial irrigation systems are to be tested annually by June 1st. Testing of containment assemblies shall be conducted by a certified tester at the customer's expense in accordance with Sec. 8-2154 of Raleigh City Code. The owner shall cause such maintenance or repairs to be made, rendering the containment assembly fully operational. Additional testing and maintenance requirements may be requested or imposed as determined by the Raleigh Director of Public Utilities or his designee. It is the owner's responsibility to keep a complete, written record of any repairs and testing of the containment assembly for at least three years.
2. Any location that does not have a current passing operational electronic test report [Sec. 8-

2154(b)] on file with the Cross Connection Program will be considered noncompliant. Owners that are in noncompliance can come into compliance by:

- A. **Testing:** Hire a certified tester to perform an operational test and submit the report to the Cross Connection Program. Irrigation report submittal period: containment assembly test reports will be accepted no more than five (5) months prior to the required test due date and year.
- B. **Deactivating:**
 - 1) **Metered Irrigation Services:** If an irrigation meter is present and you do not wish to test the backflow assembly, please call 919-996-3245 and request to stop the irrigation service and have the meter removed. Upon notification from the owner and verification by the Cross Connection Program that the irrigation account is inactive, the resident's information will be removed from the City's backflow records.
 - 2) **Branched Irrigation Services:** To deactivate an irrigation system that branches off a domestic service, the unions on the riser/stand pipes must be permanently capped. At the completion of the required work, the property owner must submit a completed Deactivated Branched Irrigation System form to the Cross Connection Program (cross.connection@raleighnc.gov or fax: 919-996-1868) Upon inspection and approval by the Raleigh Director of Public Utilities or his designee, the account will be marked inactive and testing will not be required until the system is brought back into service.
- C. **Terminating:** To permanently remove a containment assembly on a branched irrigation system, all controls and valves shall be removed with the piping capped or plugged below ground near the source of connection. An Irrigation Termination Permit and inspection is required upon completion of the required work. Please contact the Cross Connection Program to schedule an inspection of the terminated branched irrigation system. Cross.Connection@raleighnc.gov or 919-996-2747
 - 1) Note: Branched irrigation systems that are re-activated must be done with a separate meter and all City of Raleigh and North Carolina Plumbing Code policies on new installations must be followed.
- D. **Failed Operational Test:** If a containment assembly fails its operational test, the consumer will have 45 days to have all repairs made.

2.20 WINTERIZATION

- 1. The containment assembly for a lawn irrigation system may be removed for winterization when installed with unions and an upstream shut off valve not subject to freezing.

END OF SECTION 2

SECTION 3

DOMESTIC (RESIDENTIAL/COMMERCIAL) CONTAINMENT ASSEMBLY REQUIREMENTS AND USES

3.1 ACCESSIBILITY

1. All containment assemblies must be installed where the Raleigh Director of Public Utilities or his designee deems them readily accessible. Backflow assemblies may not be installed in an inaccessible, hazardous or otherwise unsuitable location including but not limited to in traffic medians, chemical rooms with corrosive fumes, behind walls, under kitchen or bathroom lavatory cabinets, crawl space, ceilings, drainage areas, side of a hill without level access or working surface, behind vent hoods etc. Readily accessible means having direct access to a containment assembly without the requirement to remove any panel, door or similar covering of the item described, and without requiring the use of portable ladders, chairs, etc. The proper installation of an insulated approved enclosure may be deemed readily accessible. Approved enclosure clearances shall comply with ASSE Standard 1060. Clearances shall allow adequate room for servicing and maintaining the containment assembly in the approved enclosure.

3.2 ALTERATIONS/MODIFICATIONS

1. No containment assembly shall be altered or modified from its approved factory configuration unless such modifications are made with strict adherence to manufacturer's recommendations. All alterations or modifications must be approved by the Raleigh Director of Public Utilities or his designee.

3.3 APPROVAL OF ALTERNATE INSTALLATIONS

1. When a special circumstance precludes the ability to comply with these requirements, the Raleigh Director of Public Utilities or his designee may approve alternate installations.

3.4 APPROVED BACKFLOW ASSEMBLIES

1. A list of approved backflow assemblies can be found on the City of Raleigh's website www.raleighnc.gov or contact the Raleigh Cross-Connection Control Office via email at cross.connection@raleighnc.gov.

3.5 AUTHORIZED TO INSTALL, REPLACE, AND REPAIR

1. Any assembly required to be installed by the provisions of this article or by a corrective order issued by the Raleigh Director of Public Utilities or his designee shall be installed by one of the following:
 - A. Licensed Class I Plumber: can install, replace, or repair irrigation, domestic, and fire (outside installations only) containment assemblies for all structures.
 - B. Licensed Class II Plumber: can only install, replace, or repair irrigation, domestic, and fire containment assemblies for single-family residential dwellings.
 - C. Limited Plumbing License: can install, replace, or repair irrigation or domestic containment assemblies of two-inch diameter or smaller.

D. Licensed Fire Sprinkler Contractors: can only install, replace, or repair containment assemblies that are a part of the fire sprinkler system. They cannot install, replace, or repair irrigation or domestic containment assemblies.

E. Licensed Utility Contractor: can install, replace, or repair irrigation, domestic, and fire containment assemblies within 5' of the building.

3.6 AUXILIARY WATER SUPPLY (RECYCLED WATER, GREY WATER, RAIN WATER, REUSE WATER, IRRIGATION WELL, CISTERN)

1. Interconnections between an auxiliary water supply and the public water supply are not permitted and considered unlawful. (Sec. 8-2143) Premises where an auxiliary water supply exists or is installed shall have an approved containment assembly in the form of an RPZ installed on the public water supply service line. (Sec. 8-2147) Make-up water connections to an auxiliary water supply including but not limited to cisterns, grey water, rain water, reuse water, recycled water, and irrigation well systems shall have a containment assembly in the form of an approved RPZ and an air gap installed on the public water supply service line. Any unapproved interconnection between an auxiliary water supply and a public water supply shall be corrected according to City of Raleigh's Article D: Water Quality Protection and NC Plumbing Code 606.6 Cross-connection control.

2. Residential owners desiring to install or maintain a well must install a containment assembly in the form of an RPZ on their domestic water service unless all auxiliary plumbing connections are completely isolated outside of any structure accepting a public water supply. RPZs must be tested annually at the customer's expense. Water meters will not be installed on dual plumbing systems until the Raleigh Director of Public Utilities or his designee receives confirmation from the local plumbing inspector or the Authority Having Jurisdiction (AHJ) that all the potable and auxiliary systems are not interconnected, and the auxiliary system piping is marked non-potable.

3.7 BYPASS /PARALLEL INSTALLATION

1. Facilities that cannot temporarily shut off the water systems to provide for a containment assembly test or repair shall install a bypass containment assembly of the same type and in some cases the same size as the main line unit. The bypass parallel assembly unit must have the square diameters equal to the square of the supply service "tap". For example, an 8" service would need at a minimum two 6" assemblies in parallel. The total capacity of the assemblies should equal or exceed the required flow for the application.

3.8 CULINARY USE

1. Containment assemblies used for culinary purposes such as canned food preparation or in dairies shall have a FDA (Food and Drug Administration) approved coating and shall be stamped with the appropriate seal.

3.9 DEAD END

1. A containment assembly shall be installed to contain a private distribution system that dead ends.

3.10 DRAIN REQUIREMENTS

1. DCVA backflow drain requirements:

A. DCVA assemblies shall be installed so that the assembly does not become submerged. A minimum clearance of 12" must be maintained from the most bottom part of the assembly to the concrete pad or floor. If DCVA is installed below grade, the underground enclosure must provide at a minimum the following:

- 1) Adequate drainage
- 2) Overlapping locking lid
- 3) Test ports capped

2. RPZ backflow drain requirements:

A. RPZ containment assemblies are not allowed to be installed below ground level. RPZs installed in above ground approved enclosures shall be installed so that the relief outlet of the assembly does not become submerged. A minimum clearance of 12" must be maintained from the most bottom part of the assembly to concrete pad or floor. Drain size shall be twice the diameter of the containment assembly or 4" minimum whichever is greater and must provide a means of positive drainage with adequate gravity drainage to atmosphere.

3.11 ENCLOSURES

1. Any DCVA or RPZ containment assembly installed outside on a domestic water service must comply with the following:

- A. Minimum insulated Class I or II approved enclosure anchored to concrete pad, fiberglass, or approved mounting pad.
- B. If Class II approved enclosure is provided, it is recommended that the containment assembly be wrapped in 1" thick pipe insulation. The relief port of the RPZ is not to be obstructed by insulation.
- C. If an RPZ is installed, provide drain port for positive drainage out of approved enclosure.
- D. If heating the approved enclosure, standard 120v GFCI electrical receptacle to be installed in accordance with the North Carolina Electrical Code.
- E. Consumer is responsible for protecting the containment assembly from freezing.
- F. If multiple containment assemblies are installed within one approved enclosure, all components of each containment assembly must be accessible for testing, repair and or replacement without having to remove another containment assembly or piping that serves another assembly. The test ports to all containment assemblies must be accessible. Approved enclosures that are damaged and do not provide adequate freeze protection may be required to be repaired or replaced.

3.12 FLOOD PRONE AREAS

1. Backflow assemblies installed in a flood plain must be installed at base flood elevation.

3.13 HAZARDOUS USES

1. Hazards are divided into the following categories:

A. Residential Moderate Hazard- Dual Check Valves

- 1) Single service connections that serve no more than two dwelling units without an auxiliary water supply or other severe hazard application within the property boundaries shall have a dual check valve installed.

B. Moderate Hazard – DCVA:

- 1) All other connections not defined as severe hazard, including but not limited to individual office buildings for Lawyers, Insurance Agents, Financial Advisors, Real Estate Agencies, Banks etc. (conditional upon the non-existence of a severe hazard within the building as listed below)

C. Severe Hazard- List includes but is not limited to the following and requires RPZ :

- 1) All lawn sprinkler systems or yard hydrants.
- 2) Wastewater treatment plants, pumps and tanks or any other container for conveying, storing or otherwise handling sewage, sewer waste lines.
- 3) Make-up water connections to a private non-potable auxiliary water system water supply including but not limited to cisterns, grey water, rain water collection and irrigation well systems. RPZ and AIR GAP required.
- 4) Pumps and tanks or any other container for 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, radioactive materials, private well or other private water supply, irrigation systems, 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 similar severe hazards or potential as determined by the Cross Connection Coordinator.
- 5) Buildings with five or more stories above ground level.
- 6) Hospitals, dental offices, veterinary clinics and other medical facilities that may have X-ray equipment, laboratory, medical washing equipment, autoclaves, aspirators, vacuum pumps.
- 7) Morgues, mortuary, autopsy facility, and crematory
- 8) Metal plating or fabrication facility
- 9) Bottling plant, chiller systems
- 10) Cannery, Packing House, Poultry House, Cold Storage Plant, Chemical Processing Plant
- 11) Battery manufacturer

- 12) Exterminator
- 13) Lawn care company, Green house
- 14) Solar Water Heater
- 15) Dairy
- 16) Film laboratory
- 17) Car wash facility
- 18) Dye work
- 19) Laundry facility, Commercial Kitchen
- 20) Swimming pool
- 21) Tattoo parlor
- 22) Water front, marine facility
- 23) Restaurant
- 24) Beauty Shop, Barber, Massage and Spa
- 25) Nursing Home, Day Care, Long Term Care Facility
- 26) Flex space occupancies such as strip centers and mall buildings or spaces approved for multiple types of occupancy use or which frequent alterations are made to the plumbing.
- 27) Power plant, Nuclear Reactor
- 28) Any location where an approved containment RPZ is required for isolation of a contaminant, an approved RPZ is required for containment. A water fee only meter requires an approved containment RPZ regardless of proposed use.
- 29) No potable water line can be directly or indirectly connected to any piping or equipment that conveys sewage.
- 30) Special use tanks or tankers containing pesticides, fertilizers, or other toxic chemicals or their residues may not be filled from a public water system except at a location equipped with an approved air gap (2 times diameter of supply pipe with a 1" minimum) and RPZ.
- 31) No supplier of water shall permit filling of such special use containers except at locations so equipped.
- 32) Hazard level is unknown at time of review.
- 33) This is not an exhaustive list. Any other hazard not specifically listed shall be determined by the Raleigh Director of Public Utilities or his designee.

3.14 IDENTIFICATION TAG

1. No manufacturer's tag or stamp that bears pertinent information shall be removed from the unit. If a manufacturer's tag or stamp is removed or damaged and rendered unreadable and the containment assembly is an approved model, the containment assembly must be marked with the original serial number or issued a new number by the Cross Connection Program.

3.15 LOCATION

1. Domestic containment assemblies must be installed no more than 50 linear piping feet from the most downstream edge of the meter box unless prior written approval for an alternative location is granted in writing by the Raleigh Director of Public Utilities or his designee. (See Section 8: Exception for Location). The containment assembly must remain accessible and visible after landscape maturity. Containment assemblies may not be installed in a hazardous location, traffic site triangle or within the right-of-way (ROW).

3.16 LOOPED SYSTEMS

1. A containment assembly shall be installed to contain a private distribution system that is looped.

3.17 MATERIALS

1. Piping materials shall conform to one of the standards listed in NC Plumbing Code Table 605.3 for water service pipe and 605.4 for water distribution pipe.

3.18 PERMITS

1. A plumbing permit is required for all new and relocated containment assembly installations. Assemblies to be replaced where the piping configuration will not be changed or modified are not required to have a permit for installation. The receipt of a plumbing permit does not relieve the owner of compliance with all applicable Cross Connection rules and regulations.

3.19 PRE-EXISTING ISSUES

1. Any approved containment assembly that has not been installed in accordance to Sec. 8-2149 of Raleigh City Code and whose location does not pose an imminent threat to the public water supply shall be considered pre-existing and compliant.

3.20 RELIEF OUTLET PIPING AND VALVE

1. In some applications, it is practical to install a drain line off of the relief port of the RPZ assembly so that in the event that there is some spillage from the device the water can be directed to a floor drain. When drains from the relief port of an approved containment RPZ are utilized, the following conditions must be met:
 - A. An approved pre-fabricated "air gap drain" as available from the backflow prevention assembly manufacturer must be utilize
 - B. All relief port drain lines shall be piped to an outside point of termination.
 - C. The RPZ relief valve shall be a minimum of 12" above any material or ground.

3.21 REPAIRS

1. If a containment assembly fails its operational test, the property owner will have 45 days from the date of notification to have all repairs made except those owners of properties with a cross-connection, auxiliary intake, interconnection or severe hazard as defined by Article D: Water Quality Protection and Appendix A: Guidelines and Requirements for the Cross Connection and Hydrant Meter Programs that is deemed, by the Cross Connection Coordinator, to be an imminent threat shall install a containment assembly required by the Raleigh City Code immediately. Failure to install the appropriate containment assembly where there is an imminent threat may result in the discontinuance of water service until such violations are corrected. Defective parts must be replaced with factory approved parts. If repair is not possible, the assembly must be replaced with a containment assembly according to the Raleigh City Code, Public Utilities Handbook, and North Carolina Plumbing Code.

3.22 SERVICE VALVE

1. The #1 shut-off valve is part of the containment assembly and may not be used as a service valve. A service valve shall be installed after the meter, outside of the ROW, and prior to every containment assembly to allow testing, maintenance and replacement of the containment assembly without the use of a City of Raleigh Public Utilities operating valve. The service valve shall be installed underground and a minimum of 18” distance from meter.

3.23 SUPPORT

1. Containment assemblies shall be properly supported so that stress on surrounding piping does not occur. Adequate support must be provided for the assembly in the approved orientation either vertically or horizontally. The assembly may not be supported by other piping or unapproved methods of support. (See: North Carolina Plumbing Code Section 308.5)

3.24 TESTING

1. Testing of containment assemblies shall be conducted by a certified tester at the customer’s expense in accordance with Sec. 8-2154 of Raleigh City Code. All newly installed containment assemblies are to be tested by a certified tester after the meter is set and annually thereafter in accordance with 3.25 Testing Schedule. The meter will not be set until the containment assembly is installed. Meter jumpers are not approved under any condition. All water use for construction purposes is to be metered. See “construction water” under the policies and procedures section of the Public Utilities Handbook and Section 9: Construction Water/Hydrant Meters. The owner shall cause such maintenance or repairs to be made, rendering the containment assembly fully operational. Additional testing and maintenance requirements may be requested or imposed as determined by the Raleigh Director of Public Utilities or his designee. It is the owner’s responsibility to keep a complete, written record of any repairs and testing of the containment assembly for at least three years.
2. Any location that does not have a current passing operational electronic test report [Sec. 8-2154(b)] on file with the Cross Connection Program will be considered noncompliant. Consumers that are in noncompliance can bring their facility into compliance by:
 - A. **Testing:** hire a City of Raleigh certified tester to perform an operational test and submit the report to the Cross Connection Program. Domestic and private distribution report submittal period: containment assembly test reports accepted only three (3) months prior to the required annual test due date.

- B. **Deactivating:** If a domestic meter is present and you do not wish to test the backflow assembly, please call 919-996-3245 and request the domestic service stopped and the meter removed. Upon notification from the owner and verification by the Cross Connection Program that the domestic account is inactive, the owner’s information will be removed from the City’s backflow records.
- C. **Terminating:** To permanently remove a containment assembly, all controls and valves shall be removed with the piping capped or plugged below ground near the source of connection. The meter box, if existing, shall be removed. A plumbing permit and inspection is required to cap or plug piping.
- D. **Failed Operational Test:** If a containment assembly fails its operational test, the owner will have 45 days to have all repairs made.

3.25 TESTING SCHEDULE

- 1. Property owners who have containment assemblies installed on fire sprinkler systems as well as domestic services may test domestic containment assemblies in accordance with the annual testing date for fire containment assemblies. Property owners or certified testers are to contact the City of Raleigh’s Cross Connection Program or contracted vendor to arrange this testing schedule exception. All other containment assemblies installed on domestic services are to be tested upon installation, replacement, and annually thereafter on or before annual test due date according to zip code:

Zip Code	Annual Test Date	Zip Code	Annual Test Date
27529	September 1st	27606	December 1st
27545	May 1st	27607	December 1st
27560	December 1st	27608	April 1st
27571	January 1st	27609	April 1st
27587	January 1st	27610	September 1st
27591	May 1st	27612	March 1st
27597	May 1st	27613	March 1st
27601	October 1st	27614	February 1st
27602	November 1st	27615	February 1st
27603	November 1st	27616	February 1st
27604	August 1st	27617	March 1st
27605	October 1st	27703	November 1st

3.26 THERMAL EXPANSION CONTROL

1. Reference NC Plumbing Code 603.7 Thermal Expansion

END OF SECTION 3

SECTION 4

FIRE PROTECTION CONTAINMENT ASSEMBLY REQUIREMENTS

4.1 ACCESSIBILITY

1. All containment assemblies must be installed where the Raleigh Director of Public Utilities or his designee deems them readily accessible. Backflow assemblies may not be installed in an inaccessible, hazardous or otherwise unsuitable location including but not limited to in: traffic medians, chemical rooms with corrosive fumes, behind walls, under kitchen or bathroom lavatory cabinets, crawl space, ceilings, drainage areas, side of a hill without level access or working surface, behind vent hoods etc. Readily accessible means having direct access to a containment assembly without the requirement to remove any panel, door or similar covering of the item described, and without requiring the use of portable ladders, chairs, etc. The proper installation of an insulated approved enclosure may be deemed readily accessible. Approved enclosure clearances shall comply with ASSE Standard 1060. Clearances shall allow adequate room for servicing and maintaining the containment assembly in the approved enclosure.

4.2 ALTERATIONS/MODIFICATIONS

1. No containment assembly shall be altered or modified from its approved factory configuration unless such modifications are made with strict adherence to manufacturer's recommendations. All alterations or modifications must be inspected by the Raleigh Director of Public Utilities or his designee.

4.3 APPROVAL OF ALTERNATE INSTALLATIONS

1. When a special circumstance precludes the ability to comply with these requirements, the Raleigh Director of Public Utilities or his designee may approve alternate installation.

4.4 APPROVED BACKFLOW ASSEMBLIES

1. A list of approved backflow assemblies can be found on the City of Raleigh's website www.raleighnc.gov or contact the Raleigh Cross Connection Control Office via email at cross.connection@raleighnc.gov.

4.5 AUTHORIZED TO INSTALL, REPLACE, AND REPAIR

1. Any containment fire sprinkler assembly required to be installed by the provisions of this article or by a corrective order issued by the Raleigh Director of Public Utilities or his designee shall be installed by one of the following:
 - A. Licensed Class I Plumber: can install, replace, or repair irrigation, domestic, and fire (outside installations only) containment assemblies for all structures
 - B. Licensed Class II Plumber: can only install, replace, or repair irrigation, domestic, and fire containment assemblies for single-family residential dwellings.

- C. Limited Plumbing License: can install, replace, or repair irrigation or domestic containment assemblies of two-inch diameter or smaller.
- D. Licensed Fire Sprinkler Contractors: can only install, replace, or repair containment assemblies that are a part of the fire sprinkler system. They cannot install, replace, or repair irrigation or domestic containment assemblies.
- E. Licensed Utility Contractor: can install, replace, or repair irrigation, domestic, and fire containment assemblies within 5' of the building.

4.6 AUXILIARY WATER SUPPLY (RECYCLED WATER, GREY WATER, RAIN WATER, REUSE WATER, IRRIGATION WELL, CISTERN)

- 1. Interconnections between an auxiliary water supply and the public water supply are not permitted and considered unlawful. (Sec. 8-2143) Premises where an auxiliary water supply exists or is installed shall have an approved containment assembly in the form of an RPZ installed on the public water supply service line. (Sec. 8-2147) Make-up water connections to an auxiliary water supply including but not limited to cisterns, grey water, rain water, reuse water, recycled water, and irrigation well systems shall have a containment assembly in the form of an approved RPZ and an air gap installed on the public water supply service line. Any unapproved interconnection between an auxiliary water supply and a public water supply shall be corrected according to City of Raleigh's Article D: Water Quality Protection and NC Plumbing Code 606.6 Cross-connection control.

4.7 BYPASS /PARALLEL INSTALLATION

- 1. Facilities that cannot temporarily shut off the water systems to provide for a containment assembly test or repair shall install a bypass containment assembly of the same type and in some cases the same size as the main line unit. The bypass parallel assembly unit must have the square diameters equal to the square of the supply service "tap". For example, an 8" service would need at a minimum two 6" assemblies in parallel. The total capacity of the assemblies should equal or exceed the required flow for the application.

4.8 DRAIN REQUIREMENTS

- 1. DCVA/DCDA backflow drain requirements:
 - A. DCVA/DCDA assemblies shall be installed so that the assembly does not become submerged. A minimum clearance of 12" must be maintained from the most bottom part of the assembly to the concrete pad or floor. If DCVA is installed below ground, the underground enclosure must provide at a minimum the following:
 - 1) Adequate drainage
 - 2) Overlapping locking lid
 - 3) Test ports capped
- 2. RPZ/RPDA backflow drain requirements:
 - A. All RPZ/RPDA containment assemblies are not allowed to be installed below ground level. RPZ/RPDAs installed in above ground approved enclosures shall be installed so that the relief outlet of the assembly does not become submerged. A minimum clearance of 12" must

be maintained from the most bottom part of the assembly to concrete pad or floor. Drain size shall be twice the diameter of the containment assembly or 4" minimum whichever is greater and must provide a means of positive drainage with adequate gravity drainage to atmosphere.

4.9 ENCLOSURES

1. All containment assemblies installed above ground shall be centered and secured on a 4" concrete pad. Installing a permanent hard piped electrical service according to North Carolina Electrical Code to a thermostatically controlled heater or heat trace is required to ensure that the unit does not freeze during prolonged periods of extreme cold weather conditions.
2. If multiple containment assemblies are installed within one approved enclosure, all components of each containment assembly must be accessible for testing, repair and or replacement without having to remove another containment assembly or piping that serves another assembly. The test ports to all containment assemblies must be accessible. Approved enclosures that are damaged and do not provide adequate freeze protection may be required to be repaired or replaced.

4.10 FIRE DEPARTMENT CONNECTIONS

1. If an FDC is installed on a heated approved enclosure, there is a minimum of 4' of empty pipe required between check valves and outside of box. (See Detail Drawing FP-17, FP-18) If the building has a fire pump, the FDC must be installed on the system side of the pump and not at the approved enclosure. The FDC cannot be installed on the supply at the street if the containment assembly is inside the building.

4.11 FIRE PUMP ACCEPTANCE TEST

1. The containment assembly installed on a fire service line must be certified and the report submitted to the City of Raleigh's Cross Connection Program before the new fire pump acceptance test.

4.12 FLOOD PRONE AREAS

1. Containment assemblies installed in a flood plain must be installed at base flood elevation.

4.13 HAZARDOUS USES

1. Severe hazards requiring a containment RPDA:
 - A. Fire Sprinkler Systems with booster pump facilities (such as fire department connections [FDCs])
 - B. Fire Sprinkler Systems with transfer pumps
 - C. Fire Sprinkler Systems with storage tanks (plus air gap)
 - D. Fire Sprinkler Systems with antifreeze solutions or chemical additives
 - E. Fire Sprinkler Systems serving 5 or more stories above ground level of the containment assembly
 - F. Fire Sprinkler Systems that are not behind a master meter (RPZ allowed on systems after a master meter)

G. Private Hydrants

2. Moderate hazard fire sprinkler systems requiring a containment DCDA:
 - A. Fire Sprinkler Systems less than 5 stories above ground level with no pumps
 - B. Fire Sprinkler Systems without antifreeze solutions or chemical additives
 - C. Dry pipe systems
 - D. Systems that are not behind a master meter (DCVA allowed on systems after a master meter)

4.14 IDENTIFICATION TAG

1. No manufacturer's tag or stamp that bears pertinent information shall be removed from the unit. If a manufacturer's tag or stamp is removed or damaged and rendered unreadable and the containment assembly is an approved model, the containment assembly must be marked with the original serial number or issued a new number by the Cross Connection Program.

4.15 LOCATION

1. Fire containment assemblies must be installed no more than 50 linear piping feet from the ROW/private property line unless prior written approval for an alternative location is granted in writing by the Raleigh Director of Public Utilities or his designee. (See Section 8: Exception for Location). The containment assembly must remain accessible and visible after landscape maturity. Containment assemblies may not be installed in a hazardous location or traffic site triangle.

4.16 LOOPED SYSTEMS

1. An approved containment assembly shall be installed to contain a private distribution system that is looped.

4.17 MATERIALS

1. Piping materials shall conform to one of the standards listed in NC Plumbing Code Table 605.3 for water service pipe and 605.4 for water distribution pipe.

4.18 MODIFICATION OF DCDA/RPDA UNITS

1. When the DCDA/RPDA bypass is in need of replacement, the defective parts must be replaced with factory approved parts (i.e. the bypass containment assembly or bypass meter must be replaced with a unit of the same size, brand and model number) since the detector assembly and main line unit are a matched set from the factory. All components of a containment assembly shall be accessible without having to remove piping that serves the FDC connection.

4.19 PERMITS

1. A plumbing and fire permit is required for all new and relocated fire containment assembly installations. The receipt of a plumbing and/or fire permit does not relieve the owner of compliance with all applicable Cross Connection rules and regulations.

4.20 PRE-EXISTING ISSUES

1. Any approved containment assembly that has not been installed in accordance to Sec. 8-2149 of Raleigh City Code and whose location does not pose an imminent threat to the public water supply shall be considered pre-existing and compliant.

4.21 PRIVATE FIRE HYDRANTS AND DEAD END MAIN LINES

1. All fire systems, fire hydrant lines and dead-end mains extending more than 10 feet from the Right of Way (ROW) are considered to be private, dead end systems and are required to have an approved Reduced Pressure Detector Assembly (RPDA) installed within 10 linear feet of the ROW/private property line.

4.22 RELIEF OUTLET PIPING

1. In some applications, it is practical to install a drain line off of the relief port of the RPZ assembly so that in the event that there is some spillage from the device the water can be directed to a floor drain. When drains from the relief port of an approved containment RPZ are utilized, the following conditions must be met:
 2. An approved pre-fabricated "air gap drain" as available from the backflow assembly manufacturer must be utilized.
 3. All relief port drain lines shall be piped to an outside point of termination.
 4. The RPZ relief valve shall be a minimum of 12" above any material or ground.

4.23 REPAIRS

1. If a containment assembly fails its operational test, the property owner will have 45 days from the date of notification to have all repairs made except those owners of properties with a cross-connection, auxiliary intake, interconnection or severe hazard as defined by Article D: Water Quality Protection and Appendix A: Guidelines and Requirements for the Cross Connection and Hydrant Meter Programs that is deemed, by the Cross Connection Coordinator, to be an imminent threat shall install a containment assembly required by the Raleigh City Code immediately. Failure to install the appropriate containment assembly where there is an imminent threat may result in the discontinuance of water service until such violations are corrected.. Defective parts must be replaced with factory approved parts. If repair is not possible, the assembly must be replaced with an approved containment assembly according to Raleigh City Code, Public Utilities Handbook, and North Carolina Plumbing Code.

4.24 SERVICE VALVE

1. The #1 shut-off valve is part of the containment assembly and may not be used as a service valve. A service valve shall be installed after the meter, outside of the ROW, and prior to every containment assembly to allow testing, maintenance and replacement of the containment assembly without the use of a City of Raleigh Public Utilities operating valve. The service valve shall be installed underground and a minimum of 18" distance from meter.

4.25 SUPPORT

1. Containment assemblies shall be properly supported so that stress on surrounding piping does not occur. Adequate support must be provided for the assembly in the approved orientation either

vertically or horizontally. The assembly may not be supported by other piping or unapproved methods of support. (See: North Carolina Plumbing Code Section 308.5)

4.26 TESTING

1. Testing of containment assemblies shall be conducted in accordance with Sec. 8-2154 of Raleigh City Code by a certified tester at the customer’s expense. All newly installed containment assemblies on fire service water lines are to be tested after installation and annually thereafter. A fire service water line may not be used to provide water for any purpose other than fire sprinkler systems. All water use for construction purposes is to be metered. See “Construction Water” under the policies and procedures section of the Public Utilities Handbook. Additional testing and maintenance requirements may be requested or imposed as determined by the Raleigh Director of Public Utilities or his designee. It is the owner’s responsibility to keep a complete, written record of any repairs and testing of the containment assembly for at least three years.
2. Any location that does not have a current passing operational electronic test report [Sec. 8-2154(b)] on file with the Cross Connection Program will be considered noncompliant. Owners that are in noncompliance can come into compliance by:
 - A. **Testing:** hire a certified tester to perform an operational test and submit the report to the Cross Connection Program. Fire report submittal period: containment assembly test reports accepted only three (3) months prior to the required annual test due date.
 - B. **Terminating:** To permanently remove a containment assembly, all controls and valves shall be removed with the piping capped or plugged below ground near the source of connection. The meter box, if existing shall be removed. A plumbing permit and inspection are required to cap or plug piping.
 - C. **Failed Operational Test:** If a containment assembly fails its operational test, the property owner must immediately notify the Fire Marshal’s office. The property owner will have 45 days to have all repairs made and the passing operational test turned into the Cross Connection Control Program

4.27 TESTING SCHEDULE

1. Property owners who have containment assemblies on fire sprinkler systems as well as domestic services may test domestic containment assemblies in accordance with the annual testing date for the fire containment assembly. Property owners or certified testers are to contact the City of Raleigh’s Cross Connection Program or contracted vendor to arrange this testing schedule exception. All other containment assemblies installed on fire services are to be tested upon installation, replacement, and annually thereafter on or before annual test due date according to zip code:

Zip Code	Annual Test Date	Zip Code	Annual Test Date
27529	September 1st	27606	December 1st
27545	May 1st	27607	December 1st
27560	December 1st	27608	April 1st

27571	January 1st	27609	April 1st
27587	January 1st	27610	September 1st
27591	May 1st	27612	March 1st
27597	May 1st	27613	March 1st
27601	October 1st	27614	February 1st
27602	November 1st	27615	February 1st
27603	November 1st	27616	February 1st
27604	August 1st	27617	March 1st
27605	October 1st	27703	November 1st

4.28 WYE STRAINER

1. No strainer shall be allowed on a fire suppression system.

END OF SECTION 4

SECTION 5

CERTIFIED TESTERS

5.1 QUALIFICATIONS

1. The City of Raleigh requires that a *certified tester* perform all testing. A certified tester is a person who has proven his/her competency to perform an operational test using a nationally accepted process and accurately complete reports on containment assemblies as evidenced by the successful completion of an approved Cross Connection Control School and compliance with all rules, regulations and policies associated with the Raleigh City Code, North Carolina DENR rules, North Carolina Plumbing Code and the applicable Contractor's licensing board. All contractors who wish to test within the City of Raleigh's water service area must be registered with the City of Raleigh's Cross Connection Control Program and attend an orientation session. Information regarding becoming a certified tester for the City of Raleigh can be found at www.raleighnc.gov under Cross Connection.

5.2 APPROVED BACKFLOW CERTIFICATION SCHOOLS

1. Information regarding training programs recognized by the City of Raleigh's Cross Connection Control Program can be found at www.raleighnc.gov under Cross Connection.

5.3 CERTIFIED TESTER RESPONSIBILITIES

1. Any certified tester who performs an operational test on any containment assembly connected to the City's public water supply shall file a report regarding the results of that operational test using the City's designated electronic reporting system managed by the currently contracted vendor as published at www.raleighnc.gov. Certified testers shall supply all testing information required by the designated electronic reporting system to included but not limited to test values for containment assembly, size, make, model, serial number and location of containment assembly, name and address of owner as recorded on notice, premise number for fire services, meter number for domestic and irrigation services, and Wake County PIN number for containment assemblies on private distribution and fire sprinkler systems. The fee for any report filed using the electronic reporting system shall be in accordance with Section 8-2154 (b) Testing and Maintenance of Assemblies. In addition, certified testers shall comply with all requirements of this code and the Raleigh Public Utilities handbook. Failure to comply may result in revocation of certified tester status.

5.4 REQUIRED DOCUMENTATION

1. A current copy of the following information is required to be on file with the Cross Connection Control Program office in order to be eligible to test within the City of Raleigh's water service area:
 - A. Tester's certificate of training and subsequent recertification training from an approved backflow certification school
 - B. Annual test kit calibration
 - C. Completed orientation packet

5.5 SUSPENSION/PROBATION

1. The Raleigh Director of Public Utilities or his designee may suspend or impose probationary provisions on a certified tester who fails to comply with any provision or requirement related to the practice of backflow installation, testing, repair or replacement that may be found in the City of Raleigh Code, rules, or policies, North Carolina DENR rules, North Carolina Plumbing Code, the code of another jurisdiction governing testing of backflows, or the rules of the licensing Board applicable to the Contractor ; or who commits fraud, deceit, negligence, incompetency, or other misconduct in the practice of backflow installation, testing, repair or replacement. The City of Raleigh will recognize and comply with any action taken by another agency to suspend or impose probationary provisions to test.

5.6 REVOCATION OF CITY OF RALEIGH BACKFLOW CERTIFICATION

1. In 2014, the City of Raleigh established a Cross Connection school for the purpose of certifying and recertifying backflow testers. The City of Raleigh may revoke its certification of a tester who is found guilty of negligence or who fails to comply with any provision or requirement of the Raleigh City Code, rule, or policy, North Carolina DENR rules, North Carolina Plumbing Code, another jurisdiction's code and the applicable Contractor's licensing boards and for gross negligence, incompetency, or misconduct, in the practice of backflow testing.

5.7 RIGHT TO APPEAL

1. The Raleigh Director of Public Utilities or his designee may provide an opportunity for an approved tester who has been suspended, placed on probation, or had certification revoked to obtain reconsideration of said action upon receipt of a written request received no later than 10 days following the effective date of suspension.

END OF SECTION 5

SECTION 6

EXEMPTION FOR BACKFLOW INSTALLATION

6.1 COMMERCIAL USES

1. Property owners whose service line connections (i) are 1” in diameter or smaller, (ii) do not provide water to multiple tenants, (iii) are not otherwise required by Raleigh City Code to have other containment assemblies, and (iv) were installed before February 21, 2015, may apply to the Raleigh Director of Public Utilities or his designee for an exemption from the requirement to install a containment assembly. Applications can be found at www.raleighnc.gov under Cross Connection/Hydrant Meter Rental Units Program.

6.2 RESIDENTIAL USES

1. Property owners whose service line connections (i) are 2” in diameter or smaller, (ii) are not otherwise required by this Code to have other containment assemblies, and (iii) were installed before February 21, 2015, may apply to the Raleigh Director of Public Utilities or his designee for an exemption to install a double check valve assembly as required by Article D: Water Quality Protection §8-2148(b). After receiving a completed application, the Raleigh Director of Public Utilities or his designee will determine whether a facility is eligible for exemption pursuant to the standards above. In the event that such exemption is approved, a letter of approval will be sent to the facility owner and the owner shall install the required containment device(s). If a facility is denied exemption, a letter of denial will be sent to the owner who will thereafter be required to install the appropriate containment assembly. Failure to comply could result in enforcement action.

END OF SECTION 6

SECTION 7

EXTENSION OF TIME FOR COMPLIANCE

7.1 EXTENSION OF TIME FOR COMPLIANCE APPLICATION

1. Owners of a facility containing a cross-connection that does not pose an imminent threat to the public water supply and who wish to apply for an extension of time for compliance not to exceed one year from the date of the original notice issued pursuant to §8-2151 of the Raleigh City Code must provide the Cross Connection Coordinator in writing the following:
 - A. A completed City of Raleigh Extension Application
 - B. Three installation bids
 - C. Completion date for required work
 - D. Proof of existing or proposed containment assemblies for any severe hazards located within the facility by means a submittal of a passing operational test report.
2. After receiving the completed application and supporting documentation, Raleigh Director of Public Utilities or his designee will determine if and for how long a facility will be granted an extension considering the length of the estimated time for completion, the cost to achieve compliance and the degree of risk of the cross connection to the public water supply system. In no instance will an extension be granted until all imminent threats at the facility are brought into compliance. The owner who is granted the extension shall indemnify and hold harmless the City from any harm or damages that may result from such person's failure to install any required containment assembly as required by Article D- Water Quality Protection of the Raleigh City Code.

END OF SECTION 7

SECTION 8

EXCEPTION FOR LOCATION

8.1 EXCEPTION FOR LOCATION APPLICATION

1. Owners, who due to installation complications, need to install a containment assembly further than the maximum 10 linear piping feet after the meter or ROW for fire service lines, may apply to the Cross Connection Program for an exception. Requests may not be made for a location that is further than 50' from the meter or ROW for fire service line. Applications can be found at www.raleighnc.gov under Cross Connection.
2. After receiving a completed application, the Raleigh Director of Public Utilities or his designee will determine, based on site conditions, if a facility will be granted an exception. A letter of approval or denial will be sent to the owner. Failure to comply with the containment assembly location installation requirements may result in enforcement action.

END OF SECTION 8

SECTION 9

CERTIFICATE OF COMPLIANCE

9.1 PURPOSE

1. The purpose of the Certificate of Compliance is to create a process to assist all property owners/water customers with the reviewing and approving of building plans for existing and new construction projects and/or the starting/transferring of water services by verifying whether or not an owner is compliant with all containment backflow requirements, and if not, to ensure that such owner/water customer becomes compliant.

9.2 EXISTING SERVICES

1. Upfit Plan Reviews:

- A. Any commercial owner of a property that currently has a domestic, irrigation and/or fire sprinkler system or residential owner who has an irrigation system served water by the City of Raleigh public water supply must apply for a Certificate of Compliance before submitting building plans for review with the City's Public Utilities Department or Development Services.
- B. Upon receipt of a completed application and verification by the Cross Connection Coordinator or his/her designee that the owner's water services are contained with approved backflows, the Cross Connection Coordinator or his/her designee will issue a Certificate of Compliance. This certificate must be presented when submitting plans for review with the City of Raleigh's Development Services Department or requesting the start of water services.
- C. If the Cross Connection Coordinator or his/her designee determines that the owner's water services are properly contained, but do not have current test reports on file with the Cross Connection Program, the Cross Connection Coordinator or his/her designee will issue a Temporary Certificate of Compliance allowing water service to be started/transferred to the new customer. The owner/water customer will have 15 business days to have all containment backflows tested by a City of Raleigh Certified Tester and all test reports submitted online to the third party vendor for backflow test reporting. Failure to submit the proper paperwork online within 15 business days will result in termination of water service. A Temporary Certificate of Compliance may be used when submitting building plans for initial review to validate there is proper backflow protection at the facility.

2. Starting/Transferring of Existing Services:

- A. Any water customer or commercial owner of a property that currently has a domestic, irrigation and/or fire sprinkler system or residential water customer or owner who has an irrigation system served water by the City of Raleigh public water supply must apply for a Certificate of Compliance before contacting Customer Care and Billing to request the start or transfer of water services.
- B. Upon receipt of a completed application and verification by the Cross Connection Coordinator or his/her designee that the owner's water services are contained with approved backflows, the Cross Connection Coordinator or his/her designee will attach the Certificate

of Compliance to the account and notify the customer the account can be started.

- C. If the Cross Connection Coordinator or his/her designee determines that the water customer's or owner's water services are properly contained, but do not have current test reports on file with the Cross Connection Program, the Cross Connection Coordinator or his/her designee will issue a Temporary Certificate of Compliance allowing water service to be started/transferred to the new customer. The owner or water customer will have 15 business days to have all containment backflows tested by a City of Raleigh Certified Tester and all test reports submitted online to the third party vendor for backflow test reporting. Failure to submit the proper paperwork online within 15 business days will result in termination of water service.
 - D. A Certificate of Compliance will be valid until the next scheduled test due date of the water customer's or owner's account unless the facility or residence has use changes. At which time the water customer or owner will surrender this Certificate of Compliance to the Cross Connection Program and install the proper approved containment backflow assemblies according to the City of Raleigh's ordinance, handbook, and NC Plumbing and Fire Code.
 - E. Owners or water customers that do not have approved containment backflow assemblies installed on all City of Raleigh water services will not be given water service. Upon installation of all approved backflow assemblies, a Temporary Certificate of Compliance will be granted to the water customer or owner thereby enabling all backflows to be tested and the paperwork submitted online to the Cross Connection Program.
 - F. Existing commercial owners, who do not have a severe hazard according to 3.13 of the City of Raleigh's Cross Connection Handbook, may apply for an Exemption for Backflow Installation.
3. New Construction:
- A. Any owner who desires to connect to the City of Raleigh's public water supply for a domestic, irrigation, fire, or private distribution system must apply for a Certificate of Compliance before submitting building plans for review
 - B. Upon receipt of a completed application and verification that the owner's facility will be contained with the proper backflows, the owner will receive a letter granting a Certificate of Approval. This certificate may be presented when submitting building plans for review with the City of Raleigh's Development Services Department.
 - C. Upon installation and verification of all approved backflow assemblies specified on the application, the water customer or owner will receive a letter granting a Temporary Certificate of Compliance allowing a water service to be started. The water customer or owner will have 15 business days to have all backflows tested and the paperwork submitted online to our Cross Connection Program. Failure to submit the paperwork online to the Cross Connection Program will result in the termination of water service. A temporary certificate must be obtained from the Cross Connection Program before contacting the City of Raleigh's Public Utilities Customer Care and Billing Division to start water services or initiate a fire service line.

END OF SECTION 9

SECTION 10

HYDRANT METER RENTAL UNITS

10.1 GENERAL

1. The City of Raleigh Public Utilities Department does not provide free or otherwise unmetered construction water or bulk water use. Customers may apply for temporary water through the City of Raleigh's Hydrant Meter Program located at the Public Utilities Meters Division Office at 3304 Terminal Dr. Bldg. 200, Raleigh, NC 27604. A hydrant rental unit consists of a hydrant meter, approved backflow assembly, and all accessories. Hydrant meter rental units are issued as temporary water service and may be recalled at any time and for any reason by the Raleigh Director of Public Utilities or his designee. The application must be accompanied with a deposit as required by the published scheduling fee per account. Additionally, there will be a charge for the cost of the water used at the outside City rate. Hydrant meter rental units are read in 100 cubic feet (ccf). Customers are responsible for notifying the Meters Division if the meter is not registering usage.
 - A. Customers will be allowed to rent the hydrant rental unit by the day, month, or year. Non-refundable rental rates for the hydrant rental unit are listed in our published fee schedule. There will be no prorating allowed on monthly and yearly accounts.
 - B. The customer is responsible for paying for the actual amount of water used (consumed) and will be billed by the City of Raleigh based on the meter readings for the rental period. Rental and consumption charges shall be billed monthly or on the date of account closure.
 - C. Hydrant meter rental unit accounts are billed monthly and readings are to be emailed, faxed, or called in by the 7th. Failure to report meter readings by the 7th of each month will result in an estimated bill of 25 ccfs for 5/8" hydrant rentals and 100 ccfs 3". When accurate readings are acquired and the usage is under the estimated billed amount, there will be a credit adjustment. If usage is over the estimated billed amount, the customer will be billed for the difference. Accounts will be assessed a fee according to the published Schedule of Charges for Water, Sewer and Reuse Water Utilities found at www.raleighnc.gov.
 - D. Hydrant rental units can only be used when the temperature is above 35 degrees. Damage to hydrant rental units from the cold weather or abuse will be charged to the customers.
 - E. Hydrant meter rental units are to be tested and maintenance performed annually; therefore, customers must return rental units to the Hydrant Program at the end of each one year block. Non-compliant accounts will be assessed an administration fee according to the published Schedule of Charges for Water, Sewer and Reuse Water Utilities found at www.raleighnc.gov.
 - F. Upon completion of hydrant usage, deposits shall be applied to the final bill. Applicable refunds will be refunded to customers within 30 days provided the following has occurred:
 - 1) Hydrant rental unit and all associated equipment is returned in good condition with no excessive wear or damage. The cost of repairs or replacement of equipment due to damage or missing equipment will be deducted from the deposit prior to any refund being processed. Repair or replacement costs that exceed the deposit will be charged

back to the customer.

- 2) All outstanding water usage and rental charges for the hydrant meter rental unit assembly have been paid in full by the customer.
- G. Office hours are Monday through Friday from 7:45am-3:45pm excluding published City of Raleigh holidays.
- H. It is a violation of the Raleigh City Code to establish a direct connection to a fire hydrant to fill a tank or tank vehicle. It is also illegal to use the test cocks of a backflow assembly for temporary water service. Violations of the Raleigh City Code will result in loss of service, fines, and other measures as specified by the Code.
- I. The City of Raleigh also offers bulk reuse water. For more information concerning bulk reuse water, contact the Neuse River Resource Recovery Facility at 919-996-3700.
- J. Continued use of a hydrant meter rental unit, when usage readings are not being registered is considered theft of City water and subject to civil penalties of up to \$5,000.00/day. It is the responsibility of the customer to notify the Meters Division at 919-996-2747 when the meter is not registering/recording the water usage properly.
- K. Hydrant meter rental units and backflow assemblies approved for use in this program are the property of the City of Raleigh's Public Utilities Department. Failure to return the hydrant rental unit at the end of the rental period will be considered theft of City property and prosecuted to the fullest extent of the law.

10.2 HYDRANT METER RENTAL UNITS USAGE INSTRUCTIONS

1. The City of Raleigh's Public Utilities Department will require all customers to view a training video and provide written instructions on the proper operation of fire hydrants and the proper techniques for the connection and removal of the hydrant meter rental unit. Additional training can be provided upon request.
2. Hydrant meter rental units may only be used on public hydrants and are not permitted to be used on private hydrants.
3. Customers must ensure that the hydrant meter rental unit is registering usage and that no leaks are present. Any broken or leaking hydrant meter rental unit shall be returned immediately to the City of Raleigh for repair. Any leaking or broken fire hydrants shall be reported immediately. Call the City of Raleigh at 919-996-2747 to report these issues. Early reporting of leaks and damage may mitigate the issuance of Civil Penalties due to the overriding interest in the conservation of water.
4. Any damage to the City of Raleigh, Towns of Garner, Wake Forest, Wendell, Knightdale, Rolesville and Zebulon fire hydrants and/or City-owned potable water system caused by the negligent use of the hydrant meter rental units and/or fire hydrant may result in the issuance of a Notice of Violation that may include Civil Penalties and will include all costs related to the damage under Raleigh City Code 8-2103 "Damage to Utility System" and 8-2014 "Enforcement Procedure".
5. Customers must follow the provided instructions and use the equipment (hose, adapter and hydrant wrenches) that is provided by the City.

6. At no time shall any hydrant meter rental unit be disassembled or altered by anyone other than City of Raleigh staff.
7. At no time shall any hose be connected to a fire hydrant that is not connected to a hydrant meter rental unit. If a hose is found to be directly connected to a fire hydrant without a hydrant meter rental unit, a Notice of Violation may be issued for receiving unmeasured water from the City of Raleigh's public water supply.
8. Hydrant meter rental units may be securely mounted to water truck/tankers and must be clearly displayed at all times. If the hydrant meter rental unit cannot be displayed while on a truck/tanker, the customer must provide the designated location at the time of rental. Truck/tankers shall NOT be filled within residential areas.
9. Only use the provided hydrant wrenches and adapters. Do NOT use a pipe wrench, crescent wrench, etc.
10. Before installing the hydrant meter rental unit, open the hydrant slowly and let the water flow for approximately 30 seconds to clear the line of debris.
11. When opening a hydrant, turn the wrench slowly counterclockwise until the wrench stops turning, then back off ¼ turn.
12. Make sure you regulate the water flow by turning your hydrant meter rental unit's gate valve, NOT by partially opening the hydrant or adjusting the ball valves on either side of the backflow (handles have been removed to prevent this). A fire hydrant must be turned completely on or it will drain. The draining is through a valve underground and will damage the area surrounding the fire hydrant and/or the fire hydrant itself.
13. Large 3" hydrant meter rental units shall not be connected directly to the fire hydrant. You must use the provided fire hose to attach the hydrant meter rental unit to the fire hydrant. However, 5/8" hydrant meter rental units can be directly connected to the fire hydrant.
14. Do NOT leave your hydrant meter rental unit on the ground. The hydrant meter rental unit must be supported and no less than 12" off the ground at its lowest point to allow for proper backflow support and drainage. The customer is responsible for providing the materials to support the hydrant meter rental unit.
15. The fire hydrant or hydrant meter rental unit should NOT be left on overnight. The hydrant meter rental unit should not be left unsecured or unattended at any time unless the construction site is securely fenced in during non-work hours or the hydrant meter rental unit is locked securely to the hydrant.
16. When closing a fire hydrant, turn the wrench slowly clockwise until the wrench stops turning, then back off a quarter turn.
17. Be sure to replace and tighten all fire hydrant caps after use. Make sure they are hand tight.
18. Do NOT let anyone drive over or place materials on the fire hose connecting the hydrant meter rental unit to the fire hydrant. It may cause severe damage to the hydrant meter rental unit, fire hydrant and water lines in the area.
19. Individuals caught using unmeasured, unauthorized water and/or an altered hydrant meter rental

unit shall be prosecuted to the fullest extent of the law. This shall include both civil and criminal penalties.

END OF SECTION 10