

AUGUSTA UTILITIES
DEPARTMENT



ENGINEERING DIVISION

BACKFLOW PREVENTION SECTION

SPECIFICATIONS FOR INSTALLATION OF BACKFLOW
ASSEMBLIES

(JANUARY 2008, FEBRUARY 2014)

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INTRODUCTION

The City of Augusta, Georgia's Utilities Department by order of the Georgia Environmental Protection Division is requiring all commercial/industrial facilities to install backflow prevention assemblies on the potable and fire service lines where city water is supplied to their facilities. All facilities must have an approved backflow prevention device installed by September 1, 2010 or be subject to enforcement action which may include termination of water service if compliance is not met. There are currently more than 7000 commercial/industrial accounts supplied by the city, many of whom may have backflow assemblies installed. However, there are numerous commercial/industrial facilities that do not have these devices in place.

The Backflow Prevention Section has compiled the following information in an effort to aid companies and individuals involved in the installation of new and upgraded backflow prevention assemblies. This information applies only to facilities connected to the City of Augusta's potable water system throughout Augusta-Richmond County, Georgia.

The Information is broken down into easily identifiable sections where general and specific installation information for various installation situations can quickly be referenced. If followed, the material provided should significantly increase installations that are passed during the first inspection by the Backflow Program Manager. This should reduce the need for reworking new and upgraded installations, Thus saving the installer time and the need for return trips to the job.

The information is to be used as a guide for general installations that encounter no unusual circumstances. When unusual situations are encountered please do not hesitate to contact the Backflow Program Manager and review the situation with him. This will save you time and a possible Failed inspection.

Please note that this information is subject to change. If at any time there are questions concerning the information provided or the installation of the backflow prevention assemblies please call The Systems Protection Section at 706-312-4145 for assistance. It is the City's hope that this information will be helpful to those involved with the installation of the backflow prevention assemblies.

All Backflow Devices Installed in Augusta, GA shall meet the Buy American ACT Standards 2009



**Utilities Department
Systems Protection Division
Backflow Prevention Section
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STANDARD SPECIFICATIONS AND DETAILS FOR THE INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES

General Information

The Type of Backflow Prevention Assembly is determined by the City of Augusta using the criteria and guidelines as set forth in the **American Water Works Association's Manual 14, Second Edition, titled Recommended Practice for Backflow Prevention and Cross-Connection Control**. Assemblies shall have current endorsement from the University of Southern California; Foundation for Cross-Connection and Hydraulic Research, which incorporates standards AWWA C510-89 for double check assemblies, and AWWA C511-89 for reduced pressure zone assemblies or approved equal certifications. The City of Augusta's Backflow Prevention Manager must approve any deviation from these specifications in writing prior to the start of installation.

Requirements for the level of backflow protection are based on the hazard category of the user. Hazard categories define the level of hazard potential to the potable water system from backflow or cross-connection based on the likelihood of and type of material subject to backflow or cross-connection incident. The hazard categories are described below but are not 100% inclusive of all facilities in a respective category.

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CATEGORY I –HIGH RISK

Considered to be potential source of a contaminate. Contaminates are toxic substances or those creating a health hazard due to the nature of the product, raw materials or processes in use by the customer. This Category would include such customers as **hospitals, mortuaries, doctor's offices, dentist offices, veterinary offices, multifamily housing or office buildings on a single meter greater than 2 stories, metal plating operations, chemical companies, restaurants, pest control companies and other commercial/industrial customers using toxic chemicals.**

Water Service connections to these customers must be protected by a **REDUCED PRESSURE ZONE (RPZ)** (up to three inch (3'') Apollo/Conbraco Model # 4A-200 or equivalent, Four (4'') and larger Apollo/Conbraco Model #40-200 or equivalent) **BACKFLOW PREVENTION ASSEMBLY or an AIR GAP** to provide maximum protection. The Alternative to the single RPZ at the meter would be a Double Check Valve (DCVA) Backflow Prevention Assembly at the meter and one or more RPZ's inside the facility at strategic locations to provide isolation/containment protection for the municipal water system. If the DCV/RPZ installation configuration is used then all assemblies must be tested annually with the reports sent to the Backflow Prevention Office. See details for installation of RPZ'S Further in this document.

CATEGORY II-MEDIUM RISK

Considered to be a potential source of a pollutant. Pollutants are substances, which are objectionable in nature such as those causing discoloration, odor or taste in the water. Typical customers in this category would include **commercial businesses such as grocery stores, daycare facilities, multifamily housing on a single meter, office buildings and any premises including residences, with auxiliary water supply.** Water Service connections in this category are required to be protected by a minimum of a **DOUBLE CHECK VALVE (DCVA)** (up to three inch (3'') Apollo/Conbraco Model # 4A-100 or equivalent, four inch (4'') and larger Apollo/Conbraco Model #4SG-100 or equivalent) **BACKFLOW PREVENTION ASSEMBLY AT THE METER.**

CATEGORY III-LOW RISK

Those considered being least likely to be a possible source of a contaminant or pollutant. Typically this category includes single family residential customers. **A DUAL CHECK (DUCV)** (¾'' and 1'' Meters Apollo/Conbraco Model #40-300 or Equivalent) **BACKFLOW PREVENTION ASSEMBLY AT THE METER** shall protect the water service connections to these customers.

GENERAL INSTALLATION REQUIREMENTS

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- 1) All Assemblies are to be installed as close as possible to the water meter. The City of Augusta's Utilities Department Backflow Program Manager must approve any variance from this location prior to installation. Failure to obtain a variance prior to installation may cause the device to be relocated.
- 2) Due to the location of the water meter at existing facilities it may not be practical to install a backflow assembly device at the water meter. In these instances the Backflow Program Manager must be contacted to visually inspect and determine the most appropriate location for the backflow device. Once location is determined a written variance will be prepared for the occupant/owner of the facility. Installation prior to inspection may not be acceptable and the backflow device may be required to be relocated.

- 3) Backflow assemblies shall include a full port ball valve on the inlet and outlet sides. Devices larger than 2 inches may have gate valves. Devices shall be fitted with three ball valve test cocks and a fourth ball valve test cock on the upstream side of the inlet shutoff valve. All Test Cocks shall be fitted with brass, stainless steel or plastic plugs and/or caps to keep the test cocks clean and free of debris.
- 4) No galvanized nipples or fittings can be installed directly into/onto an assembly, unless a dielectric or insulating fitting is used to separate the dissimilar metals.
- 5) All fire systems are required to have **DOUBLE DETECTOR CHECK (DDCA) BACKFLOW PREVENTION ASSEMBLIES** as shown in accompanying details.

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- 6) Reduced pressure zone (RPZ) devices installed outside must have a minimum of twelve inches (12") clearance from the bottom of the device to the ground and in a freeze proof box that will allow for drainage when the device discharges. Additional notes on RPZ installations are in the RPZ Installation Details and Specifications Section of this document.
- 7) Any Device installed inside, **RPZ or Double Check** must be installed per the manufactures' specifications and be easily accessible for inspection, testing and repair.
- 8) All cross-connection control devices shall be the same size as piping serving building or fire protection system.
AWWA Manual M14; USC's Manual for Cross-Connection Control 9th Edition FCCHR
- 9) A certified Backflow Assembly Tester Approved by the City of Augusta must test all assemblies. A current tester list can be obtained from the Augusta Utilities Department Backflow Prevention Section Office.
- 10) The Augusta Utilities Department Backflow Prevention Section Office requires 48 hours notice prior to any new installations of backflow assemblies.
- 11) Initial testing must be done within **five (5) working days** of the installation and reports forwarded to the City of Augusta Utilities Department Backflow Prevention Section within **ten (10) Working days**. Assemblies are to be tested annually thereafter and reports forwarded to the City within **Ten (10) Working Days** of the test. Failure to test and forward the report within the allotted time may result in removal of the tester's name from the approved list for a minimum of three (3) months. Companies and testers who continually fail to supply test reports within the allotted time may be removed from the approved list for a longer period at the desecration of the Backflow Program Manager.

INSTALLATION SPECIFICATIONS

3" AND SMALLER DOUBLE CHECK VALVE ASSEMBLY INGROUND ENCLOSURES

- 1) See the attached box detail sheet for example of the acceptable box used in non-traffic areas. This box or one of near equal dimensions may be used. Installations in concrete or asphalt shall have drop in covers. Installations in grassy areas may have either drop-in covers or covers that overlap the top of the box. If the box is to be set in concrete, asphalt or an area

subject to other than foot traffic, the box and cover must be designed for such and installation.

- 2) Top of box shall be at grade or above to prevent flooding of the installation.
- 3) The entire box bottom perimeter shall be supported on compacted or undisturbed soil, poured concrete base, complete courses of brick or block properly mortared in place, or tightly packed clean gravel (#57 Stone or larger) to prevent box from settling. If the service line is at a depth that warrants an adjustment of the box elevation then complete courses of bricks or blocks, properly mortared in place, may be used to support the entire box bottom, or a commercial box riser may be used to bring the box top level up to grade or above.
- 4) The box shall not rest directly on the water line. Pipe cutout holes must be larger than the water line and sealed with expansion foam or silicone chalk to prevent dirt and water from entering the box.
- 5) The box must have clean, compacted gravel (#57 stone or larger) at least six inches (6") deep covering the entire bottom to allow for good drainage. No mud, dirt, debris, etc. shall be left in the box.
- 6) The backflow assembly must:
 - ✓ Be clean
 - ✓ Be centered in the box if installation will permit
 - ✓ Be positioned with test cocks in a vertical position if possible
 - ✓ Have no galvanized fittings attached directly into/onto the device
 - ✓ Have test cocks fitted with brass, stainless or plastic plugs
 - ✓ Have the lowest point of the assembly a minimum of 6" from the gravel (#57 stone or larger)
 - ✓ Have top of the device between 8" and 18" from bottom of the cover
 - ✓ Have ball valves positioned so they can be opened fully from top or side
 - ✓ Be sized to the water meter, i.e. 1" meter will require 1" backflow device
 - ✓ Have attached to, or cast in the body, manufactures name, model and serial number, etc.
 - ✓ Be tested and pass within **five 5 working days** following installation and test report forwarded to the backflow prevention section within **ten (10) working days**.

3" AND LARGER DOUBLE CHECK VALVE ASSEMBLIES IN VAULTS

- 1) See the attached vault detail sheets for proper installation of all 4" and larger assemblies in precast, reinforced concrete vaults. Details cover domestic and fire service application. A complete package precast vault per detail may be used.
- 2) All assemblies must be supported with commercial pipe supports at locations shown on the attached vault detail sheets. In open bottom vaults the pipe supports must be concrete cap blocks or poured concrete footing place on compacted soil or directly on top of compacted clean gravel (#57 stone or larger). Concrete Blocks, bricks, pieces of wood, etc. are not acceptable as pipe supports and shimming is not allowed.
- 3) There must be a minimum of eight inches (8") Clearance between the bottom of the device and the gravel or vault bottom.

- 4) Open bottom vaults must have clean, compacted gravel (#57 stone or larger) at least twelve inches (12") deep covering the entire bottom to allow for good drainage, with no trash, mud or other debris left in the vault.
- 5) Inside of the vault must be free of dirt, mud, standing water and any other debris. Steps are also to be free of mud and dirt.
- 6) The ends of the vault where the pipe enters and exits must be concrete in or properly blocked in with mortared brick or blocks.
- 7) Minimum size three foot (3') X three foot (3') aluminum hatch lid to be offset to step side of vault and centered over steps.
- 8) Steps are to be on twelve inches (12") Centers maximum and centered in the hatch open.
- 9) In fire service vaults the detector check must be on the opposite side of the vault from the steps.
- 10) Solid bottom vaults shall be set in such a manner to allow for complete drainage through drainage sump openings that are provided.
- 11) The backflow assembly must
 - ✓ Be clean
 - ✓ Be fitted with gate valves
 - ✓ Be located in vault per details
 - ✓ Be positioned with test cocks in a vertical position if possible
 - ✓ Have no galvanized fittings attached directly into/onto the device
 - ✓ Have test cocks fitted with brass, stainless or plastic plugs
 - ✓ Have the lowest point of the assembly a minimum of eight inches (8") from the gravel (#57 Stone or larger)
 - ✓ Have top of the device between eight inches (8") and eighteen inches (18") from bottom of the cover
 - ✓ Be sized to the water meter, i.e. 4" meter will require 4" backflow device
 - ✓ Have attached to, or cast in the body, manufactures name, model and serial number, etc.
 - ✓ Be tested and pass within **five 5 working days** following installation and test report forwarded to the backflow prevention section within **ten (10) working days**.

REDUCED PRESSURE ZONE ASSEMBLY INSTALLATIONS—ALL SIZES

- 1) All Reduced Pressure Zone Assemblies (RPZ's) are to be installed above ground or inside the facility to protect from freezing. Exposure to freezing will result in improper functioning of an RPZ and may cause permanent damage to the assembly.
- 2) **Southern Building Code Section 304.4 (1994)-Freezing:** A water, soil or waste pipe shall not be installed or permitted outside of a building or concealed in outside walls or any place where they may be subject to freezing temperatures, unless adequate provision is made to protect them from freezing.
- 3) **Reduced** Pressure Zone Assemblies that are installed inside a facility are required to have an air gap and discharge line installed to catch water that the device will periodically discharge.
- 4) **Facilities** requiring an RPZ may be allowed to install it inside provide that either:

- ✓ There are no other connections between the meter and the building and it is unlikely one would be installed in the future or,
 - ✓ A double check is installed at the meter.
- 5) All above ground enclosures for RPZ's are to be sized to the RPZ size or larger per manufacturer's specifications. E.G. A two-inch RPZ must go in an enclosure designed for a two-inch or larger RPZ.
 - 6) The base on which an above ground enclosure sits may be a complete slab or perimeter footer. If a perimeter footer is used than clean gravel (#57 stone or larger) covering the entire bottom of the enclosure must be a full twelve inches (12") deep. See detail sheet
 - 7) All enclosures are to be designed with drainage openings large enough to accommodate a full discharge of the assembly.
 - 8) The reduced pressure zone backflow assembly must:
 - ✓ Be clean
 - ✓ Be centered in the box if installation will permit
 - ✓ Be positioned with test cocks in a vertical position if possible
 - ✓ Have no galvanized fittings attached directly into/onto the device
 - ✓ Have test cocks fitted with brass, stainless or plastic plugs
 - ✓ Have the lowest point of the assembly a minimum of twelve inches (12") from the gravel (#57 stone or larger)
 - ✓ Have ball valves positioned so they can be opened fully from top or side
 - ✓ Be sized to the water meter, i.e. a one inch (1") meter will require a one inch (1") backflow device
 - ✓ Have attached to, or cast in the body, manufactures name, model and serial number, etc.
 - ✓ Be tested and pass within **five (5) working days** following installation and test report forwarded to the backflow prevention section within **ten (10) working days**.

NOTICE TO ALL CUSTOMERS AND INSTALLERS

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- ❖ Ownership of the backflow assembly and responsibility for testing, maintenance and proper operation are that of the water consumer.
- ❖ The City of Augusta, Georgia neither accepts responsibility or liability for the backflow assembly being tested, maintained or operating properly.
- ❖ Backflow assemblies are to be installed by a licensed plumber, fire protection installer, Utility or Mechanical Contractor and repairs made by a licensed Master Plumber.
- ❖ Installation of a Backflow Prevention assembly on a service line creates a closed system. Provisions should be made for thermal expansion in the customer's system. (Georgia State Plumbing Code Section 607.3) **Thermal Expansion devices will be installed and a notation of thermal device location is to be made on test sheet.**

If you need more information, please contact the City of Augusta, Georgia's Utilities Department Backflow Prevention Section at (706) 312-4145.

Augusta Utilities
Backflow Prevention Section
360 Bay Street Suite 180
Augusta, Ga. 30901

Phone: (706) 312-4145
 Fax: (706) 312-4148

BACKFLOW PREVENTION ASSEMBLY TEST/REPAIR REPORT FORM

Time: _____ Inspector's Name: _____ Date: _____

Customer: _____

Address: _____

Location of Assembly: _____

Type of Assembly: _____ Manufacturer: _____ Model: _____ Size _____
 Serial# _____

Device Location: _____ Line Pressure at time of Test : _____

| | Check No. 1 | Check No. 2 | Differential Pressure Relief Valve | #1 gate or ball (circle one) | #2 gate or ball (circle one) | PVB/SVB |
|---------------------------|---|---|---|--|--|--|
| Test Before Repairs | _____ Leaked _____ Closed Tight DROP ACROSS PSID | _____ Leaked _____ Closed Tight DROP ACROSS PSID | Opened at _____ lbs. Differential Pressure | _____ Leaked _____ closed tight | _____ Leaked _____ Closed Tight | Air Inlet Opened @ _____ PSID _____ did not open Check Valve Held @ _____ PSID |
| Repairs And New Materials | | | | | | _____ Cleaned _____ Replaced |
| Test After Repairs | _____ Leaked _____ Closed Tight | _____ Leaked _____ Closed Tight | Opened at _____ lbs. Differential Pressure | Gate or Ball (circle one) | Gate or Ball (circle one) | Air Inlet Opened @ _____ PSID _____ did not open Check Valve Held @ _____ PSID |
| | Drop Across PSID | Drop Across PSID | | _____ Leaked _____ Closed Tight (mark One) | _____ Leaked _____ Closed Tight (mark One) | |

ABOVE DATA CERTIFIED TO BE CORRECT

Backflow Device: _____ PASSED _____ FAILED Ga Certification # _____

Tester's Signature _____ DATE _____

Thermal Expansion Device Installed Yes No Location of Thermal Expansion Device _____
 (circle one)

Method of Testing _____ TEST KIT USED _____

Comments: _____

