

CROSS CONNECTION CONTROL MANUAL



****NOTICE****

The Athens-Clarke County Cross Connection Program and manual will adhere to the current Georgia Rules for Safe Drinking Water, American Water Works Association and the 2006 International Plumbing Code.

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GENERAL INSTALLATION REQUIREMENTS

1. All assemblies are to be installed as close as possible to the water meter. Any variance from this location must be approved prior to installation by the Athens-Clarke County Cross Connection Coordinator. 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 device at the water meter. In these instances the coordinator must be contacted to visually inspect and determine the most appropriate location for the backflow device.
3. Backflow assemblies shall include full-port ball valves on the inlet and outlet sides of the backflow device. Devices two inches (2") and larger may have rubber seated gate valves. All backflow devices shall be testable. All test cocks shall be fitted with either brass, stainless or plastic plugs to keep the test cocks clean and free of debris.
4. No galvanized nipples or fittings that can be used directly into or onto any backflow assembly. Dielectric or insulating fitting can be used to separate the dissimilar metals.
5. All fire sprinkler systems are required to have a **Double Detector Check Backflow Assembly** as shown in accompanying details.
6. **Reduced Pressure Zone Assemblies** installed outside must have a minimum of a twelve (12) inches 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.
7. Any device installed inside RPZ or double check, must be installed per manufacturers specifications and easily accessible for inspection, testing and repair.
8. A certified backflow tester approved by the Athens-Clarke County Cross Connection Coordinator must test all assemblies. A current tester list can be obtained from the Coordinator.
9. Initial testing must be done within five (5) working days of the installation and the reports forwarded to the Cross Connection Control office within ten (10) working days of the test. Failure to test and forward the report within the allotted time may result in the removal of the tester's name from the tester list for a minimum of (3) months. Companies and testers who continually fail to supply test reports within the allotted time maybe removed from the tester list for a longer period of time at the discretion of the Coordinator.

INSTALLATION SPECIFICATIONS

2" and Smaller Double Check Valve In Ground Enclosures

See the attached box detail sheet (PAGE 17) for example of the acceptable box to be 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 area subject to other than foot traffic, the box and cover shall be designed for such an installation.

The top of the box shall be at grade or above to prevent flooding of the installation.

The entire box bottom perimeter shall be supported ion compacted or undisturbed soil, poured concrete base, complete courses of brick or block properly mortared in place, or tightly packed clean gravel 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 bottom, or a commercial box riser may be used to bring the box top level up to grade or above

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 caulk to prevent dirt and waterline from entering the box.

The box must have clean, compacted gravel at least six (6) inches deep covering the entire bottom to allow for good drainage. No mud, dirt, debris, etc., shall be left in the box.

The backflow assembly must:

- Be clean
- Be centered in the box if installation will permit
- Be positioned with the test cocks in a vertical position if possible
- Have no galvanized fitting attached directly into/onto device
- Have test cocks fitted with brass, stainless, or plastic plugs/caps
- Have the lowest point on assembly a minimum of six (6) inches from the gravel
- Have the top of the device eight (8) to eighteen (18) inches from the bottom of the cover
- Have ball valves positioned so they can be opened fully from top to side
- Be sized to the water meter
- Have attached to, or cast in the body, manufacturers name, model and serial number
- Be tested and pass within five (5) working days following installation and test report forwarded to the Cross Connection Control within ten (10) working days

INSTALLATION SPECIFICATIONS

2 ½“ and larger Double Check Valve In Ground Enclosures

See the attached vault detail sheets (PAGES 21 & 22) for proper installation of all 2 ½” and larger assemblies in precast, reinforced concrete vaults. Details cover domestic and fire service applications. A complete package precast vault per details may be used.

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 on concrete cap blocks or poured concrete footing placed on compacted soil or directly on top of compacted clean gravel. Concrete block, bricks, pieces of wood etc., are not acceptable as pipe supports and shimming is not allowed.

There must be a minimum of eight (8) inches of clearance between the bottom of the device and the gravel or vault bottom.

Open bottom vaults must have clean, compacted gravel at least twelve (12) inches deep covering the entire bottom to allow for good drainage. Trash, mud or other debris shall not be left in the vault.

Inside of the vault must have steps that are free of mud & debris.

The ends of the vault where the pipe enters and exits must be concreted in or properly blocked in with mortared brick or blocks.

Minimum size 3' x 3' aluminum hatch is to be offset to step side of vault & centered over the steps.

Steps are to be on twelve (12) inch centers maximum and centered in the hatch opening. In fire service vaults the detector check must be on the opposite side of the vault from the wall steps.

Solid bottom vaults shall be set in such a manner to allow for complete drainage through drainage sump openings that are provided.

The backflow assembly must:

- Be clean
- Be fitted with gate valves
- Be located in vault per details
- Be positioned with test cocks in vertical position if possible
- Have no galvanized fittings attached into/onto device
- Have test cocks fitted with brass, stainless, or plastic plugs/caps
- Be sided to water meter
- Have the lowest point of the device eight (8) inches for the gravel or bottom
- Have attached to or cast in the body manufacturers name, model and serial number
- Be tested and pass within five (5) working days following installation and test report forwarded to the Cross Connection Control Office with ten (10) working days

REDUCED PRESSURE ZONE ASSEMBLY INSTALLATIONS

All Reduced Pressure Zone Assemblies (RPZ) are to be installed above ground or inside the facility (pending approval from the Coordinator) to prevent from freezing. Exposure to freezing will result in improper functions of the RPZ and may cause damage to the device.

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 flooding.

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.

Facilities requiring an RPZ may be allowed to install the device inside provided that either:
There are no other connections between the meter and the building or,
A double check backflow device is installed at the meter.

All above ground enclosures for RPZ's are to be sized to the RPZ size or larger per manufacturer's specifications.

The base on which an above ground enclosure sits may be a complete slab or perimeter footer. If a perimeter footer is used then clean gravel covering the entire bottom of the enclosure must be a full twelve (12) inches deep.

All enclosures are to be designed with drain openings large enough to accommodate a full discharge of the assembly.

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/caps
- Have ball valves positioned so they can be opened fully from the top or side
- Be sized the water meter
- Have the lowest point on assembly a minimum of twelve (12) inches from the gravel or slab bottom
- Have attached to or cast in the body manufacturers name, model, and serial number
- Be tested and pass within five (5) working days following installation and test report forwarded to the Cross Connection Control Office within ten (10) working days

NOTICE TO CUSTOMERS AND INSTALLERS

Ownership of the backflow assembly and responsibility for its testing, maintenance, and proper operation are that of the property owner.

The Unified Government of Athens-Clarke County neither accepts responsibility nor liability for the backflow assembly being tested, maintained, or operating properly.

Backflow assemblies are to be installed by a licensed plumber 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. See Page 9.

BACKFLOW DEVICE FAILURE

First Notice

Upon notification of a backflow device failure, the customer shall have **thirty (30) days** to make all of the proper repairs or replacements to the backflow device or devices. Once the repairs or replacements have been made, a test shall be conducted to ensure the device or devices are in good working order. The test reports shall be **immediately** forwarded to the Athens-Clarke County Cross Connection Control Office.

Second Notice

If the proper repairs or replacements of a backflow device or devices are not completed in a timely manner, the customer **has ten (10) days** to comply with the notice or the water service will be **terminated**. Once the repairs or replacements are completed, the service shall be reactivated. After the service is reactivated, a test shall be conducted to ensure the device or devices are in good working order. The test reports shall be **immediately** forwarded to the Athens-Clarke County Cross Connection Control Office.

MAINTENANCE & TESTING

All backflow prevention devices shall be maintained in proper working order and tested on an annual basis. All devices shall be tested at the factory; immediately after installation, and not less than annually thereafter. All rubber parts shall be replaced at no less than five (5) year intervals. Records on location, testing and maintenance shall be kept by the consumer and copies provided to the Cross Connection Control Official.

THERMAL EXPANSION WARNING

NOTE: A thermal-expansion control device is required between a backflow preventer and storage water heating equipment. This is to limit static-pressure due to thermal expansion of the water being heated.

FREEZE PROTECTION

All backflow prevention devices are required to be protected from freezing. The requirements herein are not to be the only means of freeze protection. Any means not covered should be submitted to the Cross Connection Coordinator for approval.

ENFORCEMENT

The following actions may be taken on those users not complying with the water conservation and cross connection control activities.

Inspections – Duly authorized employees of Athens-Clarke County bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement and testing in accordance with the provisions of this ordinance.

Warning – Any person found to be violating the provisions of this ordinance shall be served written notice stating the nature of violation and shall be provided a reasonable time limit for the satisfactory correction thereof.

Terminate Service – If necessary, water service can be terminated and a reconnection fee can be established.

ATHENS-CLARKE COUNTY CROSS CONNECTION CONTROL PROGRAM

The Cross Connection Control (Isolation) Program will be enforced per the currently adopted plumbing code.

The containment program will be enforced per the ordinance adopted on May 6, 1986.

The containment program is primarily being to protect the Athens-Clarke County public water system.

Policy 1: All new services to the system must meet the program requirements at the time of occupancy or use begins.

Policy 2: Any structures or services that are added to, altered, or remodeled must meet the requirements of the program before work is completed on the project.

Policy 3: Single and double family homes are not included at this time, unless they have an irrigation system, or other potentially hazardous process on the property or an alternative water supply.

Policy 4: Existing services not included in Policy 1, 2 or 3 will be surveyed and prioritized according to degree of hazard and required to meet the containment program on that basis. It is noted that the **ISOLATION PROGRAM** will not be required on these services unless a safety hazard exists.

Policy 5: Any containment device must be installed adjacent to and downstream of the metering point or point of receiving service. This will be the device which will separate the Athens-Clarke County owned and maintained lines for the user lines. **EXCEPTIONS** may be granted by the **CROSS CONNECTION COORDINATOR** to locate the device within a structure.

Policy 6: Any user with contaminants on their property, or used in any process by the user, must use the REDUCED PRESSURE ZONE backflow preventer for containment requirements.

Policy 7: All other domestic users (except in policy 6) must use the DOUBLE CHECK VALVE backflow preventer for containment requirements.

Policy 8: Fire Protection systems shall use detector devices. Class 1, 2, and 3 shall use DOUBLE DETECTOR CHECK VALVE backflow preventers and any systems that has contaminants used in them shall use REDUCED PRESSURE ZONE DETECTOR backflow preventers for containment requirements.

ATHENS-CLARKE COUNTY CROSS CONNECTION CONTROL PROGRAM

Policy 9: Irrigation services of one (1) inch and less may use a **DOUBLE CHECK VALVE** backflow preventer, if no chemigation is used at any time in the irrigation system.

Policy 10: Irrigation systems larger than one (1) inch may use a **DOUBLE CHECK VALVE** backflow preventer, if no chemigation is used at any time in the irrigation system.

Policy 11: Irrigation systems of any size that use any type of chemigation (permanent or temporary) shall use a **REDUCED PRESSURE ZONE** backflow preventer for containment.

Policy 12: Domestic and irrigation systems that use alternate sources of water shall use a **REDUCED PRESSURE ZONE** backflow preventer for containment requirements.

Policy 13: Every service on the public water system shall be reviewed for program requirements in order of potential hazard as prioritized.

Policy 14: Any person who performs tests, repairs, or maintains a backflow device shall be certified under guidelines acceptable to the Cross Connection Coordinator.

Policy 15: Any person who installs a backflow preventer must be a Georgia licensed plumber, hold a certificate of competency for fire suppression systems from the state of Georgia, or be a certified backflow prevention device specialist.

Policy 16: Any gauge or instrument used to test a backflow device shall be calibrated annually and a record of calibration shall be submitted to the Cross Connection Control Coordinator.

PROCEDURES

New Water Services

1. File appropriate plumbing permit application and pay associated fees.
2. File application for service with the Cross Connection Office for approval.
3. File plans and specifications with the Cross Connection Office for approval. (This may be completed with the Athens-Clarke County Plans and Review office.)
4. When 1 through 3 are completed and approved the permit will be issued and the water meter and stubs installed.
5. Install service lines and backflow preventers per plans and specifications and receive inspection approval from the Plumbing Inspector and the Cross Connection Control Coordinator.
6. Test and record information of device and forward copy of report to the Cross Connection Office.
7. When all of the above is completed the Plumbing Inspector and the Cross Connection Control Coordinator will approve this portion of the job for issuance of the Certificate of Occupancy.

Existing Services Being Added to, Altered, or Remodeled

Follow procedures 1 and 3 through 7 in New Water Service.

All Other Existing Services

Single and two family dwelling users are not included in this section unless irrigation, alternate water supply or other potential hazard exists on the property.

A survey of each of the remaining users will be conducted and a list developed and prioritized in order of hazard.

From this list, the potentially hazardous will be required to meet the requirements of the Cross Connection Control Program first and so on until each user has met the requirements of the Cross Connection Program.

VAULT INSTALLATIONS

When devices are located in vaults or other below grade enclosures, the following guidelines must be met:

- Devices must be readily accessible through a light weight easy operable door, to allow for testing, repair, and replacement of the device. When the access opening is less than full size of the enclosure the opening shall be 36 inches by 36 inches.
- A ladder will be required if the enclosure floor is three (3) feet or more below the access opening.
- All enclosures for reduced pressure zone devices shall be above the ground in insulated enclosures with drains.
- Enclosures for all other devices shall have a bed of gravel twelve (12) to sixteen (16) inches deep and extend at least twelve (12) inches beyond the edges of the vault. The device shall have all test cocks plugged with brass, stainless or plastic plugs or caps.
- Enclosures for all type devices shall be sufficient size to allow for proper installation, testing, repair, and maintenance with the following minimum clearances:
 - Bottom – shall be a minimum of twelve (12) inches plus nominal pipe diameter.
 - Side with test cocks - shall be a minimum of twenty-four (24) inches.
 - Top – the access opening shall be centered over the test cocks.
- All distances shall be clear unobstructed spaces. If the manufacturer specifies a greater clearance then it shall be used in lieu of those specified herein.
- It shall be permissible to install more than one device in one enclosure. All clearances must be met for each device in the enclosure.
- Enclosures shall be as water resistant as possible. No rain or other type water shall be able to enter the enclosure. Enclosures shall be designed to carry loads imposed on them for their locations.
- Backflow devices are there to protect the water system from being contaminated, therefore they shall not be installed in a contaminated area.
- Enclosures shall not be used for any other purpose, shall be maintained clean and water free and in good state of repair. Telephone, T.V. cables, and similar items shall not be inside the enclosure.
- It is acceptable to landscape around enclosures, landscaping shall not interfere with the operation, testing, repair, and maintenance of the device.

FIRE PROTECTION SYSTEMS

For purposes of backflow prevention, fire protection systems shall be classified as sprinkler, standpipe, or combined sprinkler systems shall be further classified as follows:

Class 1:

Directly supplied from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or additives of any kind; all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets.

Class 2:

Directly supplied from public mains, same as class 1, except that booster pumps may be installed in supply lines.

Class 3:

Directly supplied from public mains, same as class 1, plus one or more of the following; elevated storage tanks or pressure tanks; fire pumps taking suction from above ground covered reservoirs or tanks. All storage facilities shall be filled from the potable water supply and maintained in a potable condition.

Class 4:

Directly supplied from public mains, similar to classes 1 and 2, and with an auxiliary water supply on or available to the premises; or an auxiliary water supply on or available to the premises; or an auxiliary water supply located with approximately 1700 feet of the pumper connection.

Class 5: Directly supplied from public mains, and interconnected with auxiliary supplies, such as: pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used.

Class 6: Directly supplied from public mains only, with or without gravity storage or pump suction tanks, and interconnected with industrial systems.

Sandpipe systems shall be further classified as non-hazardous (impurities equal to class 3 or lower sprinklers), and hazardous (impurities equal to class 4 or higher sprinklers).

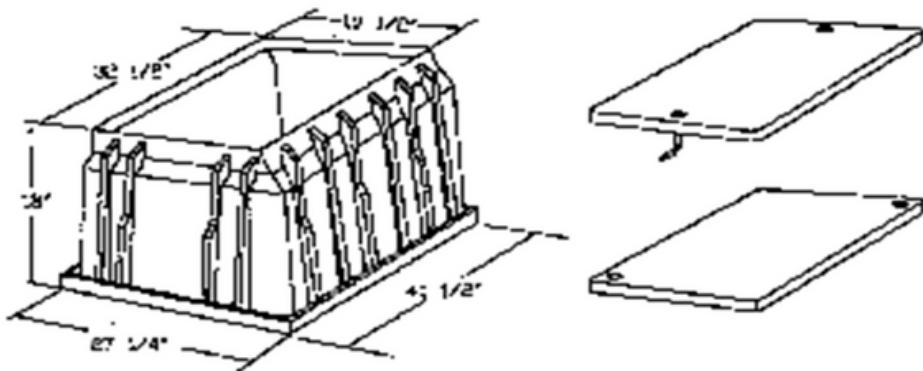
Fire protection systems shall be contained from the public water main as follows:

- Class 1, 2, and 3 systems shall be contained from the public mains by installing an approved double detector check backflow preventer.
- Class 4 and 5 sprinkler systems and hazardous standpipe systems, shall be contained by approved reduced pressure zone detector check backflow preventer.
- Class 6 sprinkler systems & stand pipe systems and stand pipe systems similar degree of potential hazard, shall be contained by procedures determined after a survey of the premises.
- Combined sprinkler and standpipe systems shall be contained from the public mains by procedures applicable to the component that requires the higher degree of protection.

ASSEMBLY & INSTALLATION DIAGRAM INDEX

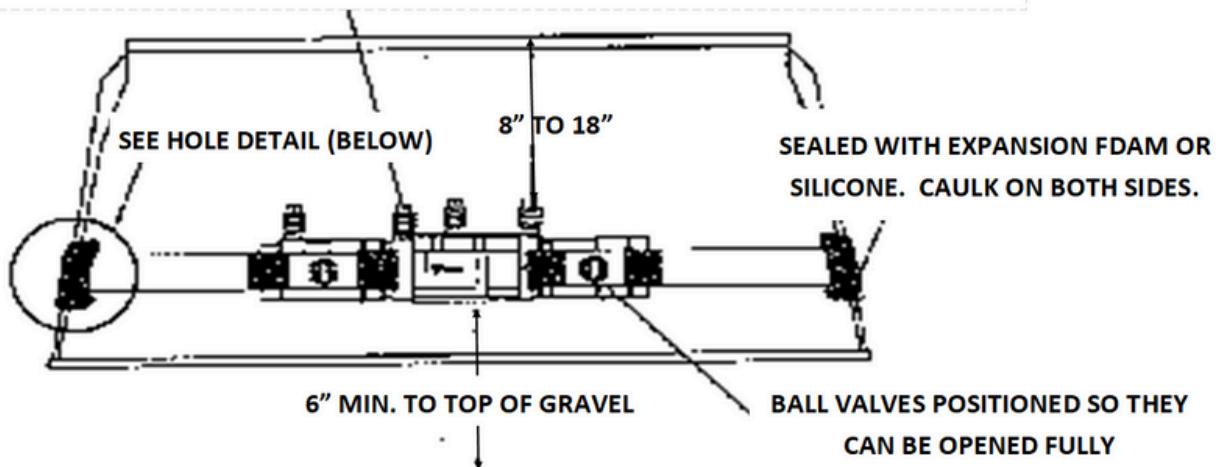
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DOUBLE CHECK ASSEMBLY INSTALLATION

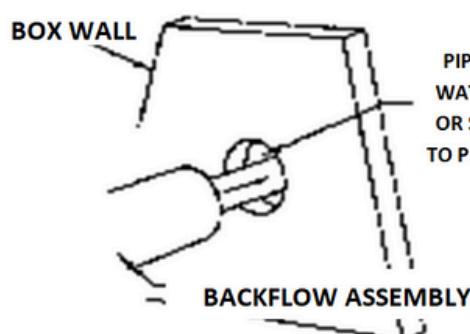


CARSON IND. SERIES 1730D BOX W/COVER (OR EQUIVALENT)

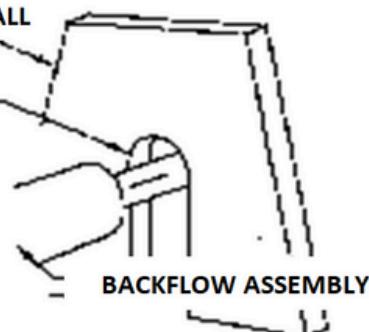
USED FOR ALL ASSEMBLIES 2" & SMALLER



DOUBLECHECK ASSEMBLY DETAIL

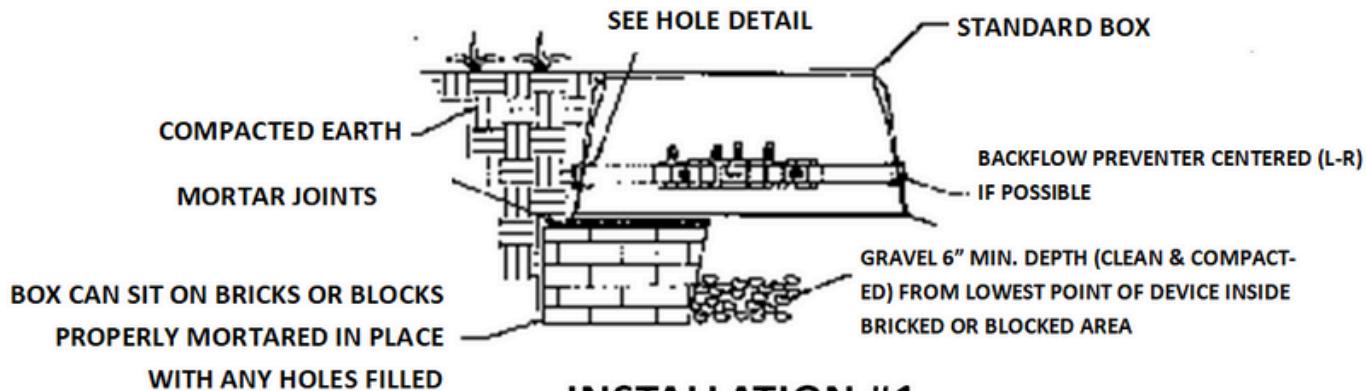


PIPE CUTOUT HOLES MUST BE LARGER THAN THE WATER LINE AND SEALED WITH EXPANSION FOAM OR SILICONE CAULK INSIDE AND OUTSIDE THE BOX TO PREVENT DIRT AND WATER FROM ENTERING THE BOX.

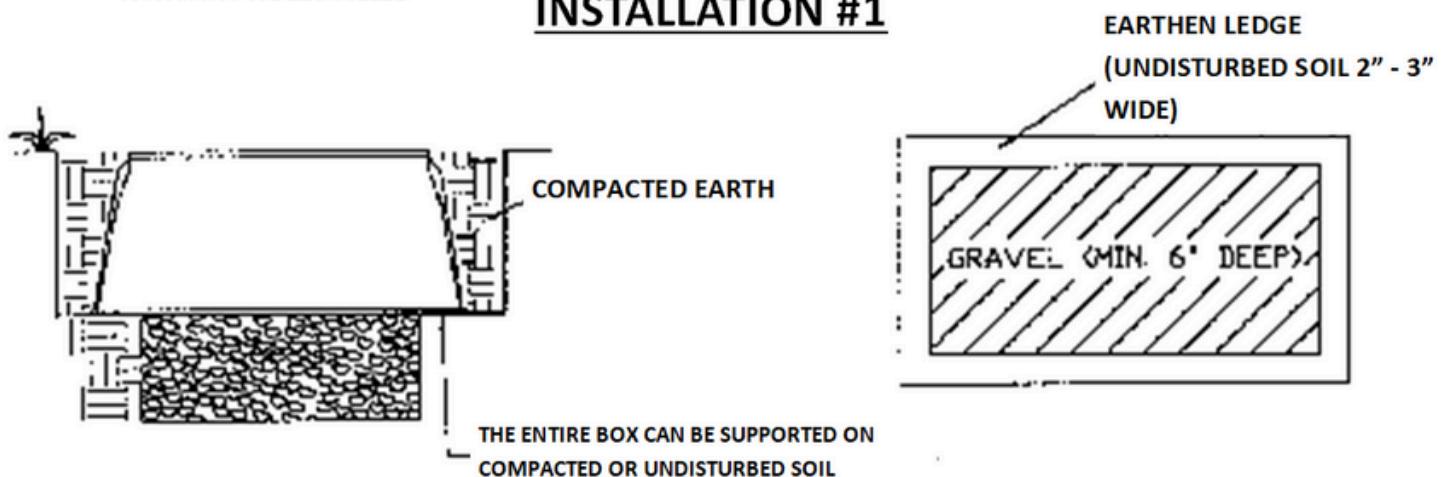


HOLE DETAIL INSIDE VIEW

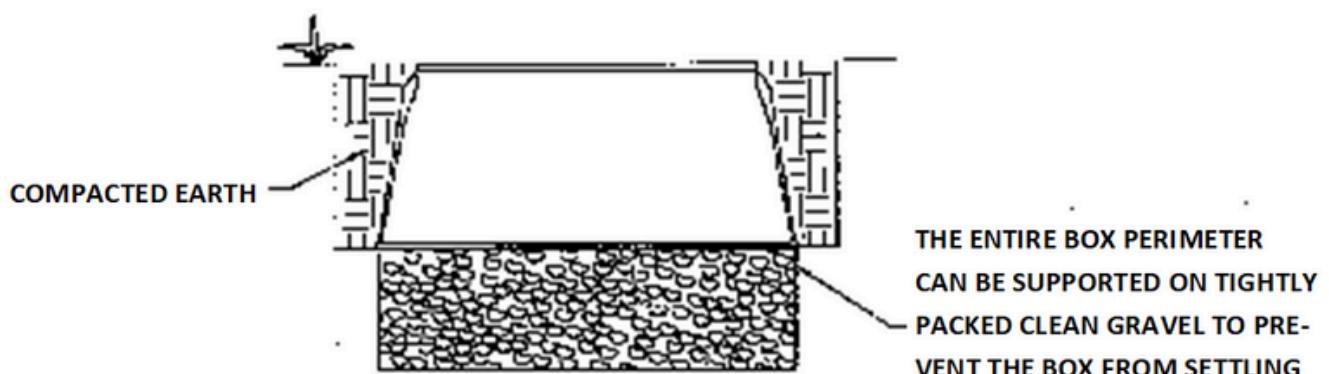
FOUNDATION VARIATIONS



INSTALLATION #1



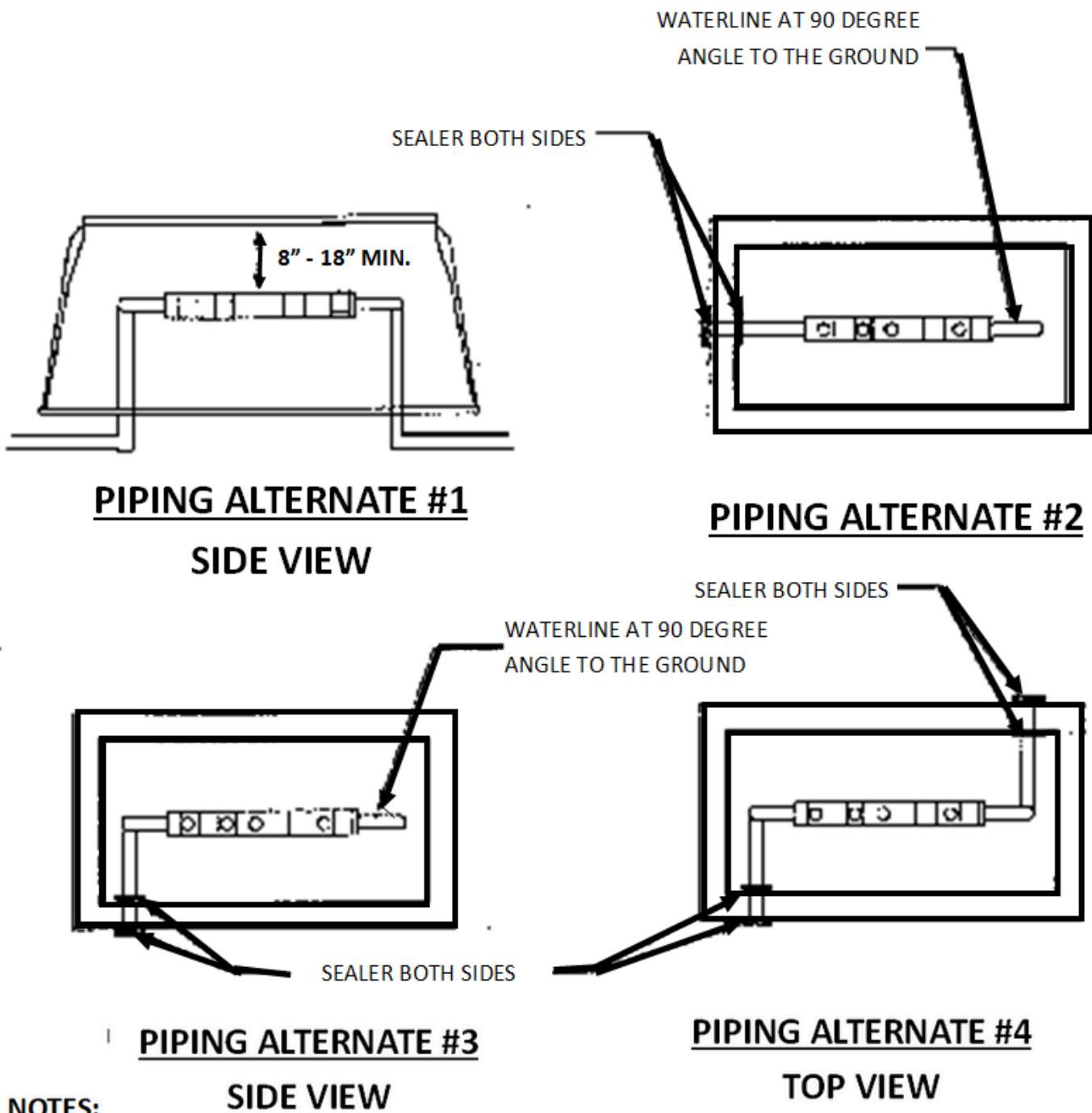
INSTALLATION #2



NOTE: OTHER TYPES OF INSTALLATION MAY BE NECESSARY DUE TO VARYING FIELD CONDITIONS. CONSULT WITH INSPECTOR BEFORE INSTALLING

INSTALLATION #3

ASSEMBLY VARIATIONS



NOTES:

SIDE VIEW

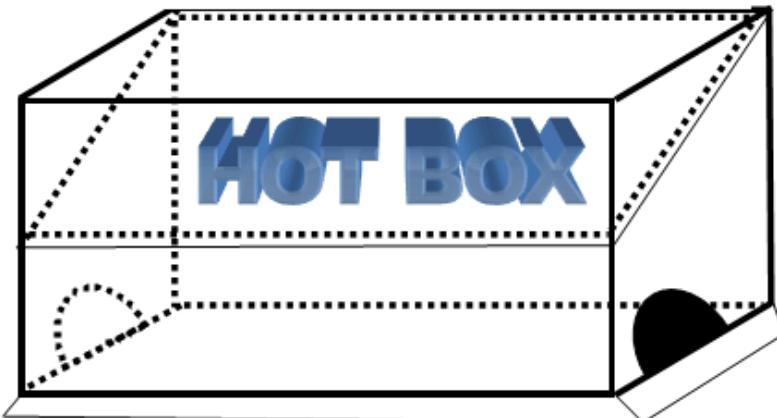
TOP VIEW

- ASSEMBLIES SHOULD BE CENTERED IN THE BOX TO ALLOW ACESST FOR TESTING AND REPAIR
- BOX MUST NOT REST ON THE WATER LINE
- ENTRY AND EXIT POINTS OF THE WATER LINE MUST BE SEALED ON BOTH SIDES TO PREVENT ENTRY OF WATER AND DIRT. SEE DOUBLE CHECK ASSEMBLY AND HOLE DETAIL.
- MINIMUM CLEARANCES TO BE MAINTAINED:
 - 8" - 18" TOP OF ASSEMBLY TO TOP OF BOX
 - 6" FROM BOTTOM OF DEVICE TO TOP OF GRAVEL
- A SMALLER BOX MAY BE USED, WITH PRIOR APPROVAL OF THE INSPECTOR, IF SPACE RESTRICTIONS WILL NOT ALLOW INSTALLATION OF THE 1730D OR ITS EQUIVALENT.

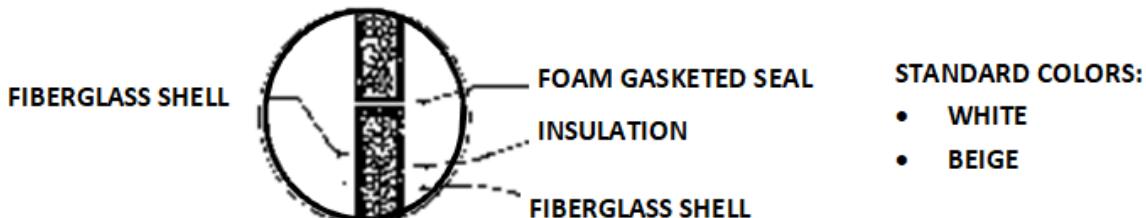
REDUCED PRESSURE ZONE ASSEMBLY INSTALLATION

ENCLOSURE: HOT BOX OR EQUIVALENT BOX,
SIZED TO ASSEMBLY SIZE 3/4" TO 2"

TWO PIECE BOX



NOTE: BOX SHOULD BE HEATED OR INSULATED
TO PROTECT FROM FREEZING



SIDE VIEW OF LIP SEAL

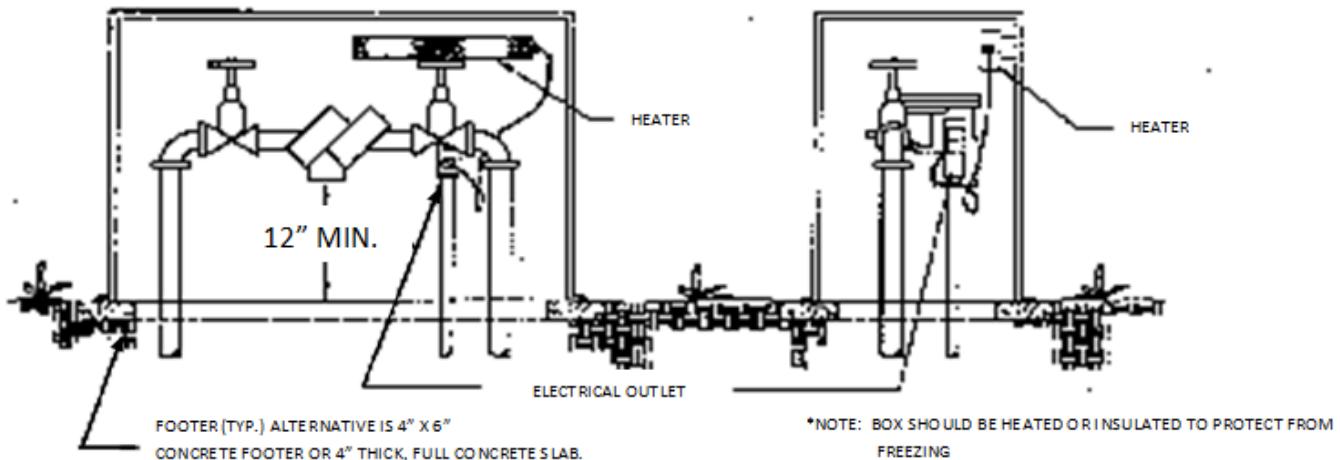
PHYSICAL PROPERTIES

MODEL No.	IPS	INSIDE DEPTH	INSIDE WIDTH	INSIDE HEIGHT	INSULATION "R" VALVE	DRAINAGE CAPACITY
0.75	3/4" - 1"	11"	19"	22"	8	180 GPM
1	3/4" - 1"	13"	27"	23"	8	181 GPM
1.5	3/4" - 1 1/2"	21"	33"	23"	8	575 GPM
2	1 1/4" - 2"	13"	39"	35"	8	575 GPM

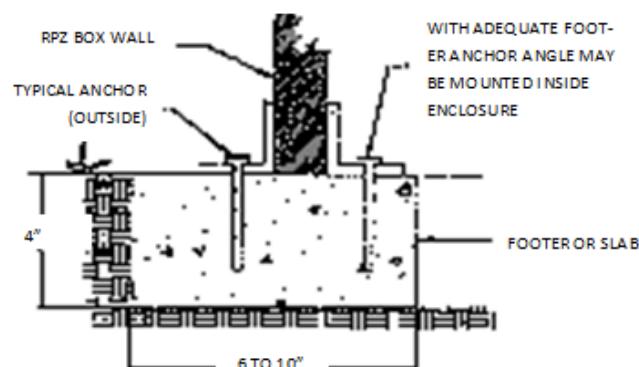
FEATURES

Fiberglass construction, drainage capacity (RPZ devices), engineered heater sizing (protection for -30 F), testing/maintenance access, ground anchor capabilities and lockable lid.

REDUCED PRESSURE ZONE ASSEMBLY INSTALLATION



RPZ INSTALLATION DETAIL

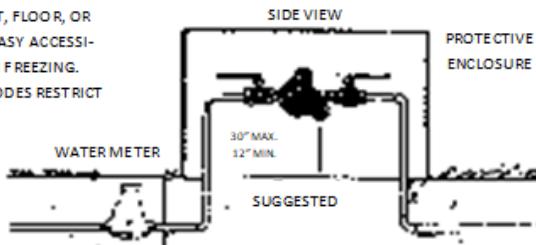


FOOTER OR CONCRETE SLAB (RPZ BOX)

NOTE: IF A PERIMETER FOOTER IS USED THEN THERE MUST BE GRAVEL COVERING THE ENTIRE BOTTOM OF THE ENCLOSURE A FULL TWELVE INCHES (12") DEEP.

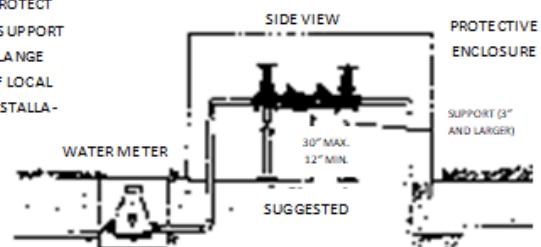
REDUCED PRESSURE BACKFLOW PREVENTER 3/4" THROUGH 2"

INSTALL WITH MINIMUM CLEARANCE OF 12" FROM THE PORT, FLOOR, OR GRADE. INSTALL FOR EASY ACCESSIBILITY. PROTECT FROM FREEZING. MAJORITY OF LOCAL CODES RESTRICT PIT INSTALLATIONS.



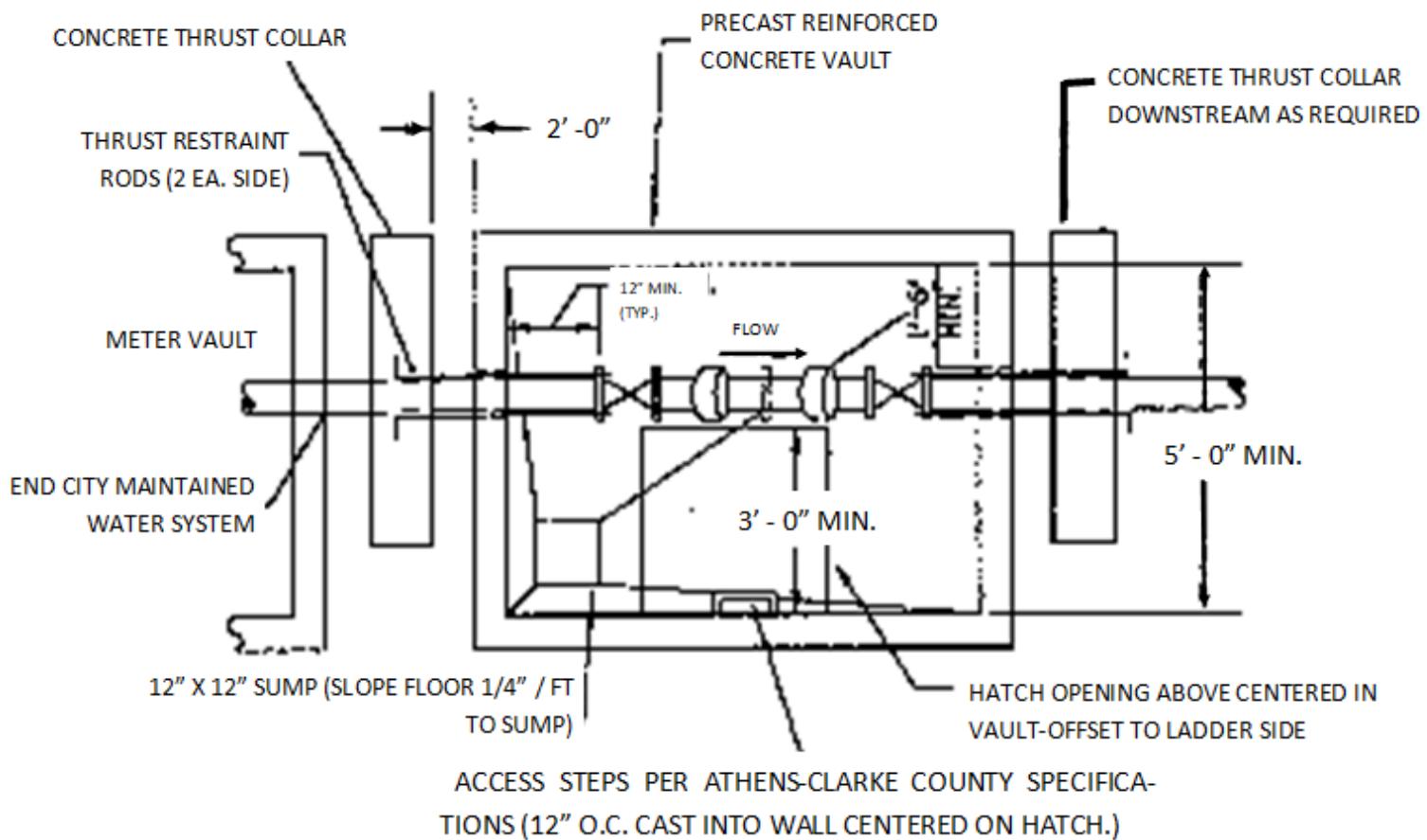
REDUCED PRESSURE BACKFLOW PREVENTER 2 1/2" THROUGH 10"

INSTALL WITH MINIMUM CLEARANCE OF 12" FROM THE PORT, FLOOR, OR GRADE. INSTALL FOR EASY ACCESSIBILITY. PROTECT FROM FREEZING. USE SUPPORT BLOCKS TO PREVENT FLANGE DAMAGE. MAJORITY OF LOCAL CODES RESTRICT PIT INSTALLATIONS.

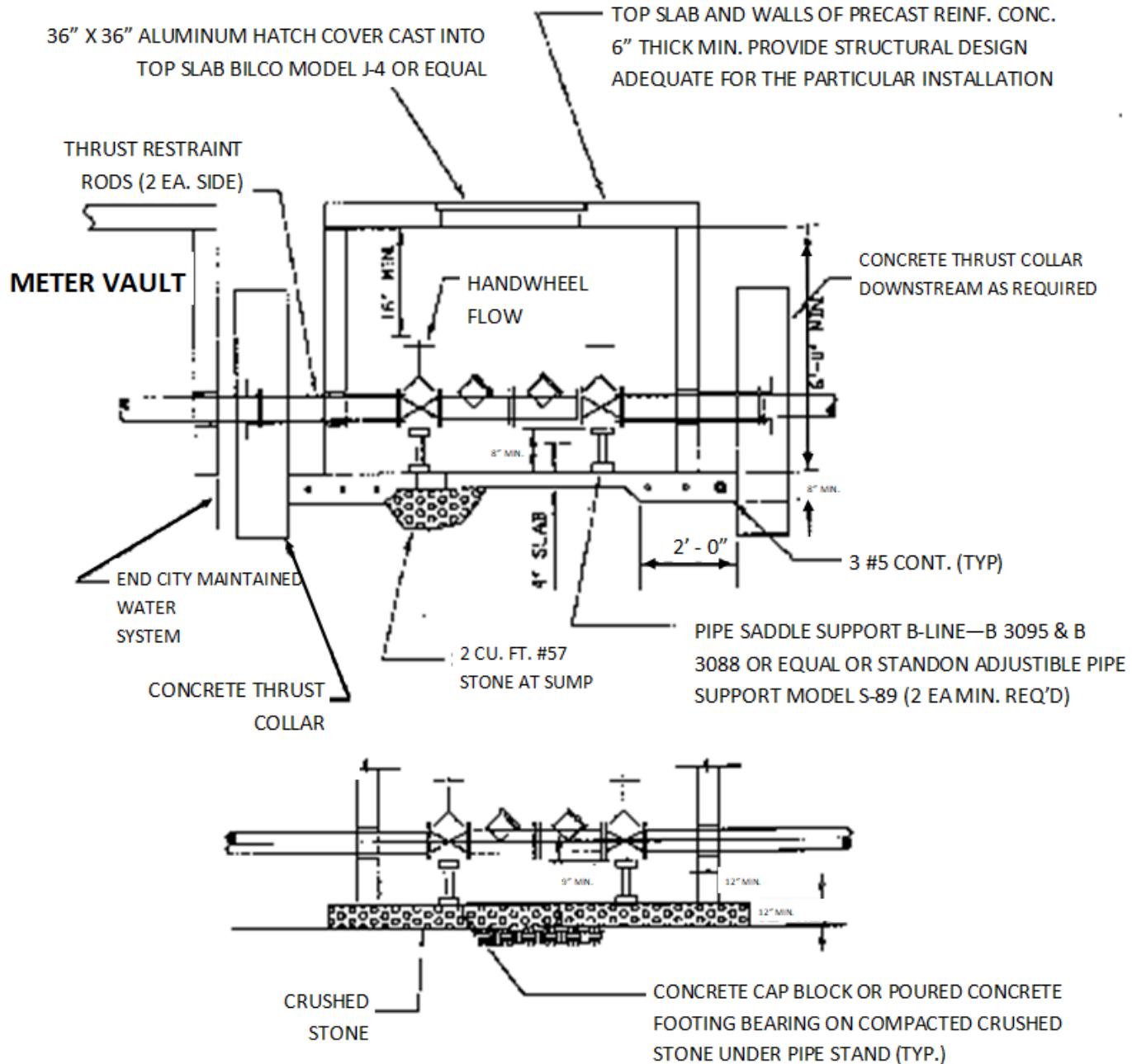


2 1/2" & LARGER DOUBLE CHECK ASSEMBLY

TYPICAL BACKFLOW PREVENTER VAULT DETAIL



2 1/2" & LARGER DOUBLE CHECK ASSEMBLY



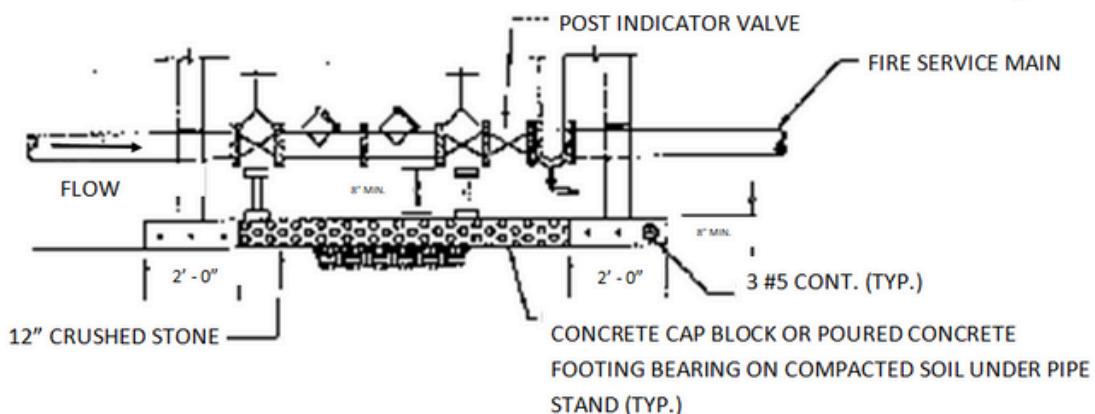
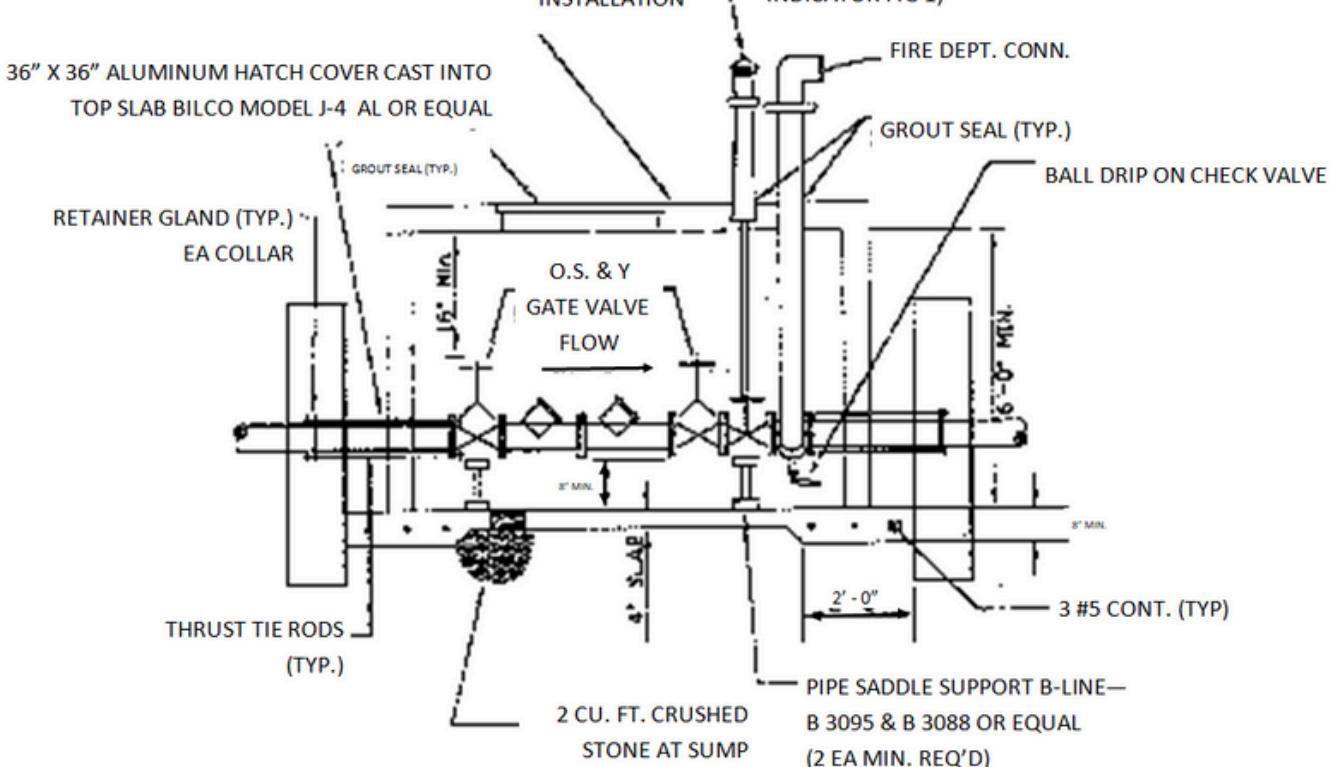
ALTERNATE VAULT BOTTOM DETAIL

NOTES:

1. DESIGN SHOWN IS FOR NON-TRAFFIC AREAS PROVIDE STRUCTURAL DESIGN ADEQUATE FOR PARTICULAR INSTALLATION.
2. SUBGRADE UNDER STRUCTURE AND BACKFILL AROUND STRUCTURE AND THRUST COLLARS SHALL BE COMPACTED TO 95% MAX. DRY DENSITY.

2 1/2" & LARGER TYPICAL FIRE VAULT

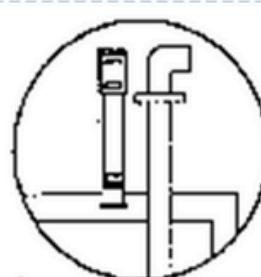
TOP SLAB AND WALLS OF PRECAST REINF. CONC. 6" THICK MIN.
PROVIDE STRUCTURAL DESIGN ADEQUATE FOR THE PARTICULAR
INSTALLATION



ALTERNATE VAULT BOTTOM DETAIL

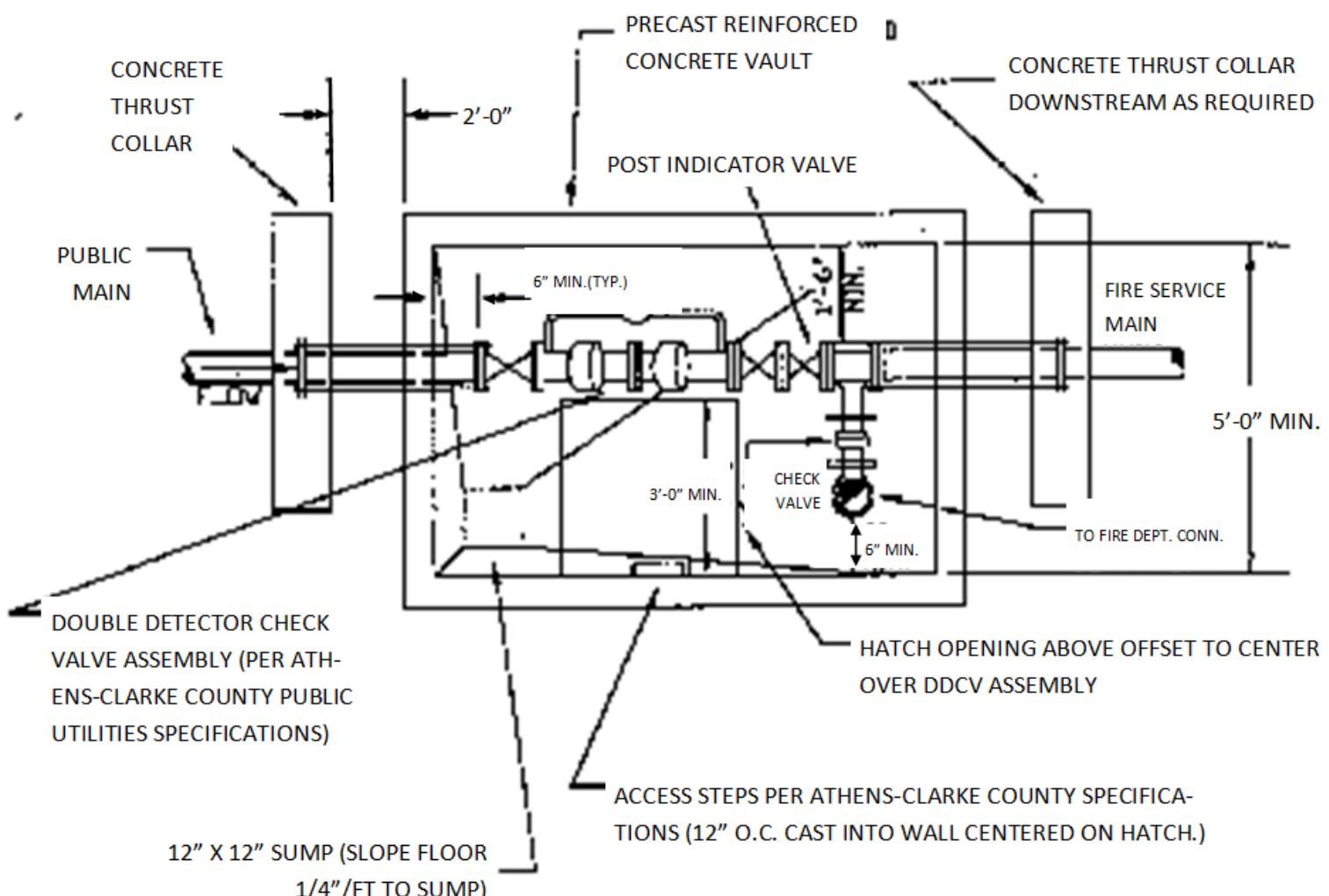
NOTES:

1. DESIGN SHOWN IS FOR NON-TRAFFIC AREAS PROVIDE STRUCTURAL DESIGN ADEQUATE FOR PARTICULAR INSTALLATION.
2. SUBGRADE UNDER STRUCTURE AND BACKFILL AROUND STRUCTURE AND THRUST COLLARS SHALL BE COMPACTED TO 95% MAX. DRY DENSITY.
3. POST INDICATOR VALVE CAN BE ELIMINATED IF SUPPLIER PROVIDES AN ACCEPTABLE METHOD FOR ATTACHING POST INDICATOR ASSEMBLY TO DOWNSTREAM O.S. & Y GATE VALVE.

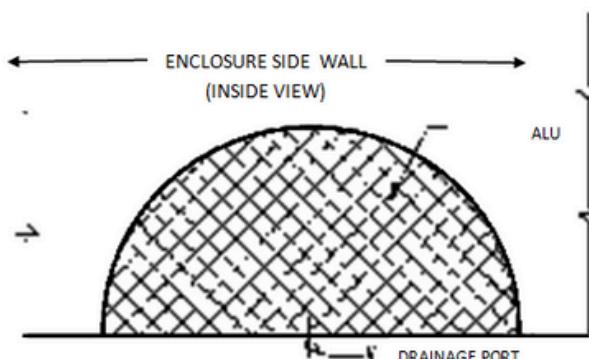


ALTERNATE INDICATOR FIG. 1

TYPICAL FIRE SERVICE VAULT DETAIL

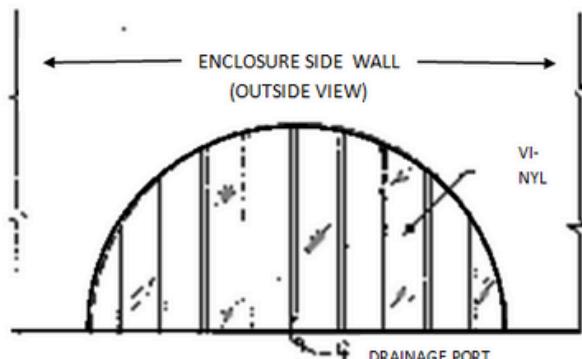


DRAIN DETAIL FOR RPZ BOX ENCLOSURE OR EQUIVALENT



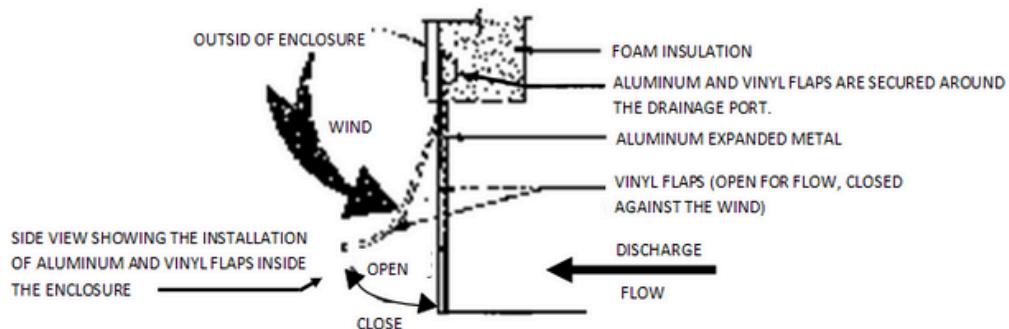
STEP ONE: INSTALLATION OF ALU-

MINUM FLATENED EXPANDED METAL FOR THE PREVENTION OF ENTRY OF SMALL ANIMALS, RODENTS AND SNAKES WHILE ALLOWING THE EXIT OF THE DRAINAGE DISCHARGE FROM THE ENCLOSURE.



STEP TWO: INSTALLATION

OF SOLID VINYL FLAPS OVER THE ALUMINUM EXPANDED METAL. THE FLAPS PREVENT THE WIND FROM ENTERING THE ENCLOSURE THROUGH THE DRAINAGE PORTS WITHOUT OBSTRUCTING THE DRAINAGE DISCHARGE.



NOTE

- 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 un-repairable damage to the assembly
- Southern Building code Section 304.4 – Freezing (1994): 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.
- Facilities requiring an RPZ may be allowed to install it inside provided 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.
- 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 inches (2") or larger RPZ.
- If a perimeter footer is used then clean gravel covering the entire bottom of the enclosure must be a full twelve inches (12") deep.
- All enclosures are to be designed with drain openings large enough to accommodate a full discharge of the assembly.

5.2 TYPICAL CROSS-CONNECTION OCCURRENCES AND RECOMMENDED PROTECTION

Auxiliary Water Systems

An approved backflow-prevention assembly shall be installed at the service connection of the water purveyor to any premises where there is an auxiliary water supply or system, even though there is no connection between the auxiliary water supply and the public potable water system.

NOTE: In order that the water purveyor may more clearly understand the meaning of the term auxiliary water supply it is necessary to define its meaning. The following discussion will help to clarify this phrase.

The term auxiliary water supply is commonly used to describe water supplies or sources not under the control or the direct supervision of the water purveyor. Typical of such water supplies are natural waters derived from wells, springs, streams, rivers, lakes, harbors, bays, and oceans. Also considered an auxiliary water supply, other than the public potable water supply under the control of the water purveyor, are used waters that have passed beyond the water purveyor's control (at the point of delivery) and that may be stored, transmitted, or used in such a manner as to pollute or contaminate them. Finally, there may be public potable water supplies furnished by some other water purveyor that may or may not be under good sanitary control or may be otherwise unacceptable to the water purveyor.

Types of used water supplies include

- Water in industrialized water systems;
- Water in reservoirs or tanks used for fire-fighting purposes;
- Irrigation reservoirs;
- Swimming pools, fish ponds, and mirror pools;
- Memorial and decorative fountains and cascades;
- Cooling towers

Baptismal, quenching, washing, rinsing, and dipping tanks.

All of these supplies, including a public potable water system in which the water purveyor does not exercise sanitary control, are potential hazards to the public water system. These waters might become polluted or contaminated because of industrial processes; contact with human body, dust, vermin, birds, and so forth; or by means of chemicals or organic compounds that may have been introduced into the tanks, lines, or systems for scale, corrosion, algae, bacterial, or odor control, or for similar treatment.

5.2 TYPICAL CROSS-CONNECTION OCCURRENCES AND RECOMMENDED PROTECTION

In the event that backflow occurs because of inadequate protection at the service connection of the purveyor, polluted or contaminated used waters or industrial fluids may be discharged into the public water system. Therefore, it is necessary for the water purveyor to evaluate the potential hazard and to take the necessary steps to protect the public water system according to the degree of hazard found. In making such an evaluation, it is not deemed necessary that the auxiliary water sources be developed and interconnected with the potable water system through cross connections. It is only necessary to determine that the water or fluids are available to the premises and of the quantity sufficient to make it desirable and feasible for the consumer to develop and use the supply.

RISK CATEGORIES

General Information

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 a backflow or cross-connection incident. The hazard categories are described below but are not 100% inclusive of all facilities in a respective category.

Category I – High Risk:

Considered to be a potential source of a contaminant: 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 offices, dentist offices, veterinary offices, metal plating operations, chemical companies, 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) backflow preventer or an Air Gap to provide maximum protection. The alternative to the single RPZ at the meter would be a Double Check Valve (DCV) backflow device at the meter and one or more RPZ's inside the facility at strategic locations to provide isolation/containment protection for the public water supply. If the DCV/RPZ installation configuration is used all of the assemblies must be tested annually with reports sent to the Cross Connection Control Office.

Category II – Moderate 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, restaurants, day care facilities, multifamily housing on a single meter, office buildings and any customers commercial, industrial, or residential with irrigation. Water service connections in this category are required to be protected by a Double Check Valve backflow device at the water meter.

Category III – Low Risk

Those considered to be least likely to be a possible source of contaminant or pollutant. Typically this category includes single family residential customers. The water service connections to these customers would be protected by a Double Check Valve backflow device at the meter.

GEORGIA RULES FOR SAFE DRINKING WATER

Chapter 391-3-5-13

Cross Connections

Ammended

1. No person shall construct, maintain or operate a physical arrangement whereby a public water system may be connected directly or indirectly with a non-potable water system or non-permitted water system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain contaminated water, liquid, gasses, sewage or other waste of unknown or unsafe quality, which may be capable of imparting contamination to the public water system as the results of backflow, bypass or changeover devices, or other temporary, permanent or potential connections through which or because of which back-flow or back-siphonage could or would occur.
2. A supplier of water or any person having possession or control of facilities which may cause the contamination of a public water system has the responsibility to prevent water from unapproved sources or any contaminants from entering the public water system by such physical arrangements cited in paragraph (1) if this rule.
3. Any person connecting to and purchasing water from a public water system and reselling it to others is considered a supplier of the water so purchased as well as a consumer, and is also responsible for the quality of such water.
4. A supply shall, when requested by the Division, develop a control program for elimination and prevention of all cross-connections. A written plan for the program shall be submitted to the Division for review and approval within two (2) years of less in accordance with a written request by the Division. When the plan is approved, the owner shall implement the program immediately.
5. The procedures for backflow and back-siphonage prevention and cross-connection shall conform to those recommended by the American Water Works Association, Manual 14, and the U.S. Environmental Protection Agency Cross-Connection Manual.

EXERT FROM: AMERICAN WATER WORKS ASSOCIATION, MANUAL OF WATER SUPPLY PRACTICES

Recommended Practice for Backflow Prevention and Cross-Connection Control

For administrative purposes, the water purveyor may subdivide auxiliary water supplies into the following three general classifications:

An approved public potable water supply over which the water purveyor does not have sanitary control;

Any private water supply, other than the water purveyor's approved public potable water supply, on or available to the premises; and

Used waters and industrial fluids, such as waters in reservoirs, cooling towers, recirculation systems, industrial fluid systems, and so forth.

Protection recommended. In the following examples, the degree of hazard is classified and the type of backflow-prevention assembly is recommended.

Public Potable Water Systems

Interconnection with an approved backflow prevention assembly shall be required on any direct interconnection (except as noted hereafter) between the water purveyor's approved public potable water supply and another approved public potable water supply over which the purveyor does not have sanitary control. This may be accomplished in the following manner:

- An air-gap separation or a reduced-pressure principle backflow-prevention assembly is recommended at the service connection when the auxiliary water supply is or may be contaminated to a degree that would constitute a health hazard.
- A double check valve assembly is recommended at the service connection when the auxiliary water supply is being operated under a public health permit but is not acceptable to the water purveyor as a source.
- No backflow protection at the service connection is recommended if the auxiliary water system has a properly conducted sanitary control program in force, and the auxiliary water supply is acceptable to the water purveyor as a source.

EXERT FROM: AMERICAN WATER WORKS ASSOCIATION, MANUAL OF WATER SUPPLY PRACTICES

Private Water Supply

An approved backflow-prevention assembly shall be installed at the service connection to any premises in which there is any available water supply other than the water purveyor's public potable water supply. This may be accomplished in the following manner:

- An air-gap separation or a reduced-pressure principle backflow-prevention assembly is recommended at each service connection when the auxiliary water supply is or may be contaminated to a degree that would constitute a health or system hazard.
- A double check valve assembly is recommended at each service connection when the auxiliary water supply is or may be subject to pollution, such as when there is no health or system hazard.

Used Waters and Industrial Fluids

An approved backflow-prevention assembly shall be installed at the service connection to any premises on which there is a used water supply or a system containing industrial fluids. This will include premises where there are reservoirs, cooling towers, recirculating systems, and other used-water or industrial-fluid systems. This may be accomplished in the following manner.

- An air-gap separation or a reduced-pressure principle backflow-prevention assembly is recommended where there is a health hazard.
- A double check valve assembly should be used where there is only a pollution hazard

EXERT FROM: INTERNATIONAL PLUMBING CODE 2006

vided where required in accordance with Sections 607.3.1 and 607.3.2.

607.3.1 Pressure-reducing valve. For water service system sizes up to and including 2 inches (51 mm), a device for controlling pressure shall be installed where, because of thermal expansion, the pressure on the downstream side of a pressure-reducing valve exceeds the pressure-reducing valve setting.

607.3.2 Backflow prevention device or check valve. Where a backflow prevention device, check valve or other device is installed on a water supply system utilizing storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.

607.4 Flow of hot water to fixtures. Fixture fittings, faucets and diverters shall be installed and adjusted so that the flow of hot water from the fittings corresponds to the left-hand side of the fixture fitting.

Exception: Shower and tub/shower mixing valves conforming to ASSE 1016 or CSA B125, where the flow of hot water corresponds to the markings on the device.

SECTION 608 PROTECTION OF POTABLE WATER SUPPLY

608.1 General. A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply through cross-connections or any other piping connections to the system. Backflow preventer applications shall conform to Table 608.1, except as specifically stated in Sections 608.2 through 608.16.10.

608.2 Plumbing fixtures. The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1.

608.3 Devices, appurtenances, appliances and apparatus. All devices, appurtenances, appliances and apparatus intended to serve some special function, such as sterilization, distillation, processing, cooling, or storage of ice or foods, and that connect to the water supply system, shall be provided with protection against backflow and contamination of the water supply system. Water pumps, filters, softeners, tanks and all other appliances and devices that handle or treat potable water shall be protected against contamination.

608.3.1 Special equipment, water supply protection. The water supply for hospital fixtures shall be protected against backflow with a reduced pressure principle backflow preventer, an atmospheric or spill-proof vacuum breaker, or an air gap. Vacuum breakers for bedpan washer hoses shall not be located less than 5 feet (1524 mm) above the floor. Vacuum breakers for hose connections in health care or laboratory areas shall not be less than 6 feet (1829 mm) above the floor.

608.4 Water service piping. Water service piping shall be protected in accordance with Sections 603.2 and 603.2.1.

608.5 Chemicals and other substances. Chemicals and other substances that produce either toxic conditions, taste, odor or discoloration in a potable water system shall not be introduced into, or utilized in, such systems.

608.6 Cross-connection control. Cross connections shall be prohibited, except where approved protective devices are installed.

608.6.1 Private water supplies. Cross connections between a private water supply and a potable public supply shall be prohibited.

608.7 Stop-and-waste valves prohibited. Combination stop-and-waste valves or cocks shall not be installed underground.

608.8 Identification of potable and nonpotable water. In all buildings where two or more water distribution systems, one potable water and the other nonpotable water, are installed, each system shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.3.

608.8.1 Information. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at maximum intervals of 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

608.8.2 Color. The color of the pipe identification shall be discernable and consistent throughout the building.

608.8.3 Size. The size of the background color field and lettering shall comply with Table 608.8.3.

TABLE 608.8.3
SIZE OF PIPE IDENTIFICATION

PIPE DIAMETER (inches)	LENGTH BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
1/2 to 1 1/4	8	0.5
1 1/2 to 2	8	0.75
2 1/2 to 6	12	1.25
8 to 10	24	2.5
over 10	32	3.5

For SI: 1 inch = 25.4 mm.

608.9 Reutilization prohibited. Water utilized for the cooling of equipment or other processes shall not be returned to the potable water system. Such water shall be discharged into a drainage system through an air gap or shall be utilized for non-potable purposes.

608.10 Reuse of piping. Piping that has been utilized for any purpose other than conveying potable water shall not be utilized for conveying potable water.

608.11 Painting of water tanks. The interior surface of a potable water tank shall not be lined, painted or repaired with any material that changes the taste, odor, color or potability of the water supply when the tank is placed in, or returned to, service.

CASE HISTORIES

Backflow at an Agricultural Premises

Date of Backflow Incident: June 1983

Location of Backflow Incident: Woodsboro, Maryland

Source(s) of Information:

- Pacific Northwest Section of the American Water Works Association, *Summary of Backflow Incidents*, Fourth Edition, 1995
- U.S. Environmental Protection Agency, *Cross-Connection Control Manual*, 1989
- Watts Industries, Inc.; *Watts Regulator News/Stop Backflow*

Case History

In June 1983, “yellow gushy stuff” poured from some faucets in the Town of Woodsboro, Maryland. Town personnel notified the County Health Department and the State Water Supply Division. The State dispatched personnel to take water samples for analysis and placed a ban on drinking the Town’s water. Firefighters warned residents not to use the water for drinking, cooking, bathing, or any other purpose except flushing toilets. The Town began flushing its water system. An investigation revealed that the powerful agricultural herbicide Paraquat had back flowed into the Town’s water system.

Someone left open a gate valve between an agricultural herbicides holding tank and the Town’s water system and, thus, created a cross-connection. Coincidentally, water pressure in the Town temporarily decreased due to failure of a pump in the Town’s water system. The herbicide Paraquat was back siphoned into the Town’s water system. Upon restoration of pressure in the Town’s water system, Paraquat flowed throughout much of the Town’s water system.

Fortunately, this incident did not cause any serious illness or death. The incident did, however, create an expensive burden on the Town. Tanker trucks were used temporarily to provide potable water, and the Town flushed and sampled its water system extensively.

CASE HISTORIES

Backflow at a Fire Protection System

Date of Backflow Incident: June 1979

Location of Backflow Incident: Meridian, Idaho

Source(s) of Information:

- American Water Works Association, *Recommended Practice for Backflow Prevention and Cross Connection Control*, AWWA Manual M14, Second Edition, 1990
- Pacific Northwest Section of the American Water Works Association, *Summary of Backflow Incidents*, Fourth Edition, 1995

Case History

On June 18, 1979, residents in the City of Meridian, Idaho, complained that their water had an odor and taste of onions. At this time, the City was routinely flushing fire hydrants in the area of the complaints. The City could not see a consistent pattern to the odor or the complaints.

By isolating portions of the water system and conducting a premises-by-premises inspection, the City narrowed the source of the odor to one area containing a supermarket, a car wash, and a church printing firm. When the City flushed the nearest fire hydrant, the odor became very strong. Inspection revealed that an alarm check valve on a fire sprinkler system in the supermarket was leaking and allowing stagnant water to backflow from the sprinkler system into the public water system.

When the pressure in the public water system was reduced during fire hydrant flushing, the alarm check valve on the fire sprinkler system at the supermarket would leak, but the check valve would not open enough to set off the alarm. The City turned off water service to the supermarket fire sprinkler system, and the odor and taste problem did not occur during hydrant flushing.

Analysis of water samples taken from the supermarket fire sprinkler system showed *Clonothrix fusa* and *Zoogleora ramigera* bacteria in sufficient concentration to cause the onion odor and taste problem.

CASE HISTORIES

Backflow at a Premises With an Auxiliary Water System

Date of Backflow Incident: July 1993

Location of Backflow Incident: Coos Bay, Oregon

Source(s) of Information:

- Pacific Northwest Section of the American Water Works Association, *Summary of Backflow Incidents*, Fourth Edition, 1995

Case History

The occupants of a house in Coos Bay, Oregon, installed an auxiliary water system that consisted of irrigation piping supplied by water pumped from a drainage pond. The water in this pond was probably highly contaminated because it flowed from a fill area previously used for septic disposal. Eventually, the pump at the drainage pond failed. While the pump was at a repair shop, the wife noticed that the lawn needed watering, so she connected a hose from the house's potable water system to the irrigation piping. The husband returned with the repaired pump, installed it, and turned it on. The pump forced pond water through the hose connection, through the house's potable water system, and into the public water system.

Fortunately, a water meter reader was at the house at the time the water from the drainage pond was pumped into the public water system. The meter reader notified his office, and water system personnel isolated the contaminated portion of the public water system.

CASE HISTORIES

Backflow at a Premises With a Reclaimed Water System

Date of Backflow Incident: September 1996

Location of Backflow Incident: Hillsborough County, Florida

Source(s) of Information:

- Hillsborough County Water Department

Case History

On September 18, 1996, a meter reader with the Hillsborough County Water Department noticed that the water meter at a home in northwest Hillsborough County was registering backwards. A cross-connection had been created between the potable and reclaimed water system at this premises, and reclaimed water was back flowing into the public potable water system.

Apparently, the County's reclaimed water service connection to this residential premises had recently been hooked up to an existing irrigation system at the premises. The irrigation system, which was previously supplied with water from the home's potable water system, was not disconnected from the home's potable water system. The County Water Department estimated that about 50,000 gallons of reclaimed water back flowed into the public potable water system.

After discovering the cross-connection, County Water Department personnel immediately shut off reclaimed water service to the residential premises where the cross-connection was found and notified the County Health Department of the cross-connection. County Water Department personnel then began flushing potable water mains in the area and advised the owner of the premises where the cross-connection was found to flush all water outlets at the premises. Based upon analysis of water samples collected by its Environmental Laboratory staff, the County Water Department reckoned that the cross-connection's impact was limited to the portion of the public potable water system within 1,000 feet of the cross-connection.

On September 19, the owner of the residential premises where the cross-connection was found, hired a plumber to eliminate the cross-connection.



BACKFLOW-PREVENTION
 "a community environmental health protection program"
ASSEMBLY TEST DATA and MAINTENANCE REPORT

Account Name: _____					
Mailing Address: _____					
Service Address: _____				Meter #: _____	
Location of Assembly: _____				Installation Date: _____	
Type of Assembly: _____		Manufacturer: _____	Model: _____	Size: _____	
Date: _____		Initial <input type="checkbox"/>	Semi Annual <input type="checkbox"/>	Annual <input type="checkbox"/>	
Domestic <input type="checkbox"/> Fire <input type="checkbox"/> Irrigation <input type="checkbox"/>		Other <input type="checkbox"/>	Isolation <input type="checkbox"/>	Line Pressure at time of test: _____ P.S.I.	
CHECK VALVE NO. 1		CHECK VALVE NO. 2		DIFFERENTIAL PRESSURE RELIEF VALVE	
1. Leaked <input type="checkbox"/> 2. Closed at _____ P.S.I.D. <input type="checkbox"/>		1. Leaked <input type="checkbox"/> 2. Closed at _____ P.S.I.D. <input type="checkbox"/>		1. Opened at _____ P.S.I.D. <input type="checkbox"/> 2. Did Not Open <input type="checkbox"/>	
Cleaned <input type="checkbox"/> Replaced: Disc <input type="checkbox"/> Spring <input type="checkbox"/> Guide <input type="checkbox"/> Pin Retainer <input type="checkbox"/> Hinge Pin <input type="checkbox"/> Seal <input type="checkbox"/> Diaphragm <input type="checkbox"/> "O" Rings <input type="checkbox"/> Complete Repair Kit <input type="checkbox"/> Other, Describe: _____		Cleaned <input type="checkbox"/> Replaced: Disc <input type="checkbox"/> Spring <input type="checkbox"/> Guide <input type="checkbox"/> Pin Retainer <input type="checkbox"/> Hinge Pin <input type="checkbox"/> Seal <input type="checkbox"/> Diaphragm <input type="checkbox"/> "O" Rings <input type="checkbox"/> Complete Repair Kit <input type="checkbox"/> Other, Describe: _____		Cleaned <input type="checkbox"/> Replaced: Disc <input type="checkbox"/> Uppar <input type="checkbox"/> Lower <input type="checkbox"/> Spring <input type="checkbox"/> Diaphragm, Large <input type="checkbox"/> Upper <input type="checkbox"/> Lower <input type="checkbox"/> Diaphragm, Small <input type="checkbox"/> Upper <input type="checkbox"/> Lower <input type="checkbox"/> Spacer, Lower <input type="checkbox"/> "O" Rings <input type="checkbox"/> Complete Repair Kit <input type="checkbox"/> Other, Describe: _____	
R E P A I R S					
FINAL TEST	Closed at _____ P.S.I.D. <input type="checkbox"/>		Opened at _____ P.S.I.D. <input type="checkbox"/>		
BPP Test Kit Manufacturer: _____		Kit Model No.: _____	Kit Serial Number: _____	Date: _____	
Remarks: _____					

I HEREBY CERTIFY THAT THIS DATA IS ACCURATE (TRUE) AND REFLECTS THE PROPER OPERATION, TEST, AND/OR MAINTENANCE OF THIS ASSEMBLY

Tested By: (Signature)	(Print Name)
RETURN REPORT TO:	Repaired By: (Signature) (Print Name)
Meter Management Cross Connection P.O. Box 1868 Athens, GA 30603	Final Test By: (Signature) (Print Name)
Training Certification No.:	Certification Exp. Date:
TURN WATER ON <input type="checkbox"/>	

NOTES

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NOTES

ATHENS-CLARKE COUNTY

2025

CROSS CONNECTION CONTROL MANUAL

Jeff Ausburn
Cross Connection Coordinator
Office 762-400-7576 • Cell 762-400-2909 • Fax 706-613-3483
jeff.ausburn@accgov.com

Mitch Moore
Fats, Oils and Grease Inspector
Office 762-400-7574 • Cell 706-612-0828 • Fax 706-613-3483
mitch.moore@accgov.com

