

Town of Yadkinville

Backflow Prevention Ordinance and Installation Manual

**Prepared:
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**BACKFLOW PREVENTION ORDINANCE AND
INSTALLATION MANUAL**

POLICY EFFECTIVE DATE: January 1, 2003

The Town of Yadkinville will give customers six (6) months from the effective date of January 1, 2003 to come into compliance with said Ordinance. After July 1, 2003, compliance will go strictly by the Ordinance.

Chapter 4

Backflow Prevention

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SECTION 1: CROSS CONNECTION CONTROL

Sec. 5-4-01. Purpose

- a. To protect the public potable water supply of the Town of Yadkinville from the possibility of contamination or pollution due to back siphon age or backpressure, by isolation within the consumer's private water system such contaminants or pollutants, which could backflow into the public water system.
- b. To define the authority of the Town of Yadkinville as the water purveyor entitled to eliminating all cross-connections, new or existing within it's public water system.
- c. To provide a continuing inspection program of cross-connections, which may be installed in the future.

Sec. 5-4-02. Responsibility: Town of Yadkinville

- a. The Town of Yadkinville Public Works Department will be primarily responsible for preventing any contamination or pollution of the public water system. This responsibility begins at the point of origin of the public water supply and includes all of the public water distribution system, and ends at the service connection under the Safe Drinking Water Act. The Backflow Administrator shall exercise vigilance to ensure that the consumer/customer has taken the proper steps to protect the public potable water system.
- b. When it has been determined that a backflow protection assembly is required for the prevention on contamination of the public water system, the Backflow Administrator shall notify the owner, in writing, of any such building or premises, to correct within a time set by this ordinance, any plumbing installed or existing that is in violation of this ordinance.
- c. After surveying the private water system the Backflow Administrator will select an approved backflow prevention assembly required for containment control to be installed at service entrance.
- d. Prior to the installation of any backflow prevention assembly, the owner of the private water system must be notified that the installation of a backflow prevention assembly may create a closed system, and as a result thermal expansion may occur. Under such circumstance, the customer must understand and assume all liability and responsibilities for that phenomenon.

Sec. 5-4-03. Responsibility: Customer

- a. The customer has the responsibility of preventing contaminants and pollutants from entering the customer's private water system or the public water system operated by the Town of Yadkinville. The customer, at his own expense, shall install, operate, and maintain all backflow prevention assemblies specified within this ordinance.
- b. If a tenant customer does not maintain the private water system and has no authority to bring the system into compliance with the provisions of this ordinance the Town of Yadkinville may assert any available action against the tenant to assure the private water system is brought into compliance with this ordinance.

Sec. 5-4-04. Definitions

a. As used in this article, the following terms *shall* have the meanings provided in this section unless the context clearly indicates otherwise.

1. **Air-Gap Separation**. An unobstructed vertical distance through the atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. An approved air-gap vertical separation *shall* be at least double the diameter of the supply pipe. In no case *shall* the air-gap be less than one (1) inch.
2. **Approved**: Certified in writing by the (Person in Responsible Charge) as an acceptable device or methodology for the purpose of backflow prevention.
3. **Auxiliary Intake**: Any piping connection or other device whereby water *may* be secured from a source other than public water supply.
4. **Backflow**: Any flow of water into the public water supply from any other source due to a cross-connection, auxiliary intake, interconnection, backpressure, backsiphonage, any combination thereof, or other cause.
5. **Backpressure**: Any pressure on any source of water other than the public water supply that may be greater than the pressure on the public water supply and *may* result in a backflow.
6. **Backflow Prevention Device**: An approved effective device method used to prevent backflow from occurring in the potable water supply. The type of device required *shall* be based on degree of hazard, existing or potential.
7. **Back-Siphonage**: Any circumstance in which the pressure on the public water supply *may* be reduced to the point that the elevation and atmospheric pressure on a source of water other than the public water supply *may* result in a pressure to be greater than the pressure on the public water supply and *may* result in a back flow.
8. **Certified Tester**: A person who has proven his/her competency to test, repair, overhaul and make reports on backflow prevention devices as evidenced by certification of successful completion of a training program approved by the (Person in Responsible Charge).
9. **Confinement Device**: A backflow prevention device, as approved and required, installed within a private plumbing or distribution system to isolate a localized hazard from the remainder of said system.
10. **Consumer**: Any person, firm, or corporation responsible for any property at which water from the Town public water supply is

received. In the absence of other parties or the failure of other parties to accept the responsibilities herein set forth, the owner of record *shall* be ultimately responsible. A backflow prevention device as approved 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.

11. **Contamination**: The presence of any foreign substance (organic, inorganic, radiological, or biological) in water that tends to degrade its quality as to constitute a hazard or impair the usefulness of the water.
12. **Containment Device**: A backflow prevention device, as approved and required, 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.
13. **Cross-connection**: Any physical connection whereby the public water supply is connected with any other water supply system, whether public or private, either inside or outside of any building or buildings, in such a manner that a flow of water into the public water supply is possible either through the manipulation of valves or because of ineffective check or back-pressure valves, or because of any other arrangement.
14. **Cross-Connection Control Coordinator**: The official position established and authorized by the Town designated by the (Person in Responsible Charge) to administer, interpret this section and who *shall* be a certified tester.
15. **Double Check Valve Backflow Prevention Device**: An approved assembly composed of two (2) single, spring-loaded independently operating check valves, including tightly closing shut-off valves located at each end of the assembly, and having suitable connections for testing the watertightness of each check valve.
16. **Dual Check Valve**: An approved device containing two (2) independently acting check valves in series.
17. **Fire Line**: A system of pipes and equipment used to supply water in an emergency for extinguishing fire.
18. **Interconnection**: Any system of piping or other arrangement whereby the public water supply is connected directly with 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.
19. **Pressure Vacuum Breaker**: An approved assembly containing an independently operating spring loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly must be equipped with suitable

connections for testing the proper operation of the device and tightly closing shut-off valves located at each end of the assembly.

20. **Public Water Supply**: The water and waterworks system of the Town and its customers outside the Town limits, for general use and which supply is recognized as the public water supply by the North Carolina Department of Environmental Health and Natural Resources
21. **Reduced Pressure Zone Principle Backflow Prevention Device (RPZ)**: An approved device containing within its structure, two (2) spring loaded independently operating check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow the pressure between the checks *shall* be less than the supply pressures. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, *shall* operate to maintain the pressure between the check valves less than the supply pressure. This device *shall* have suitable connections for testing the proper operation of the device, including tightly closing shut-off valves located at each end of the device

Sec. 5-4-05. Compliance with Federal and State Law

- a. The Town will comply with the Federal Safe Drinking Water Act, the North Carolina Drinking Water Act, and North Carolina State Building Code, which pertain to cross-connections, auxiliary intakes and interconnections, and establish an effective ongoing program to control potential sources of contamination of the public water supply.
 1. **Unlawful Connections**: It *shall* be unlawful for any person to cause across-connection, auxiliary intake or inter-connection to be made; or allow one to exist for any purpose whatsoever.
 2. **Inspection of Property**: It *shall* be the duty, upon request of the (Person in Responsible Charge), of the cross connection coordinator to cause inspections to be made of properties served by the public water supply where cross-connections with the public water supply are deemed possible. The frequency of inspections and reinspections *shall* be set by the (Operator in Responsible Charge).
 3. **Right of Access**: The (Person in Responsible Charge), or authorized representative, *shall* have the right to enter, at reasonable time, any nonresidential property served by a connection to the Town public water supply for the purpose of performing the duties of this article. In those cases in which the property owner chooses not to provide such access, the (Person in Responsible Charge), or authorized representative, *may* designate the location as a high hazard in accordance with Sec. 5-4-05:5.

4. **Existing Conditions:** Any consumer *shall* be allowed ninety (90) days to correct any cross-connections, auxiliary intakes, interconnections or other hazard as defined by **Sec. 5-4-05:5** of this code in violation of the provisions of this ordinance. The ninety (90) days will be from the date of receipt of the notification given by the Cross Connection Coordinator.

5. **Hazardous Uses:** The following uses *shall* be classified as hazardous uses:
 - a. Hazardous uses include, but are not limited to: pumps and tanks 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, flush valve toilets without vacuum breaks, bacterial and viral materials, private wells or other private water supply, irrigation systems, water systems or hose connections, with booster pumps, carbonation equipment, or similar hazard potential as determined by the cross connection coordinator.
 - b. Any location at which the nature or mode of operations within a premises are such that frequent alterations are made to the plumbing or at which there is a likelihood in the determination of the Cross Connection Coordinator that protective measures may be subverted, altered, or disconnected.
 - c. Any facility which contains, but is not limited to, a bottling plant, cannery, building have five (5) or more stories, battery manufacturer, exterminator, greenhouse, chemical processing plant, dairy, dye works, film laboratory, car wash, hospital, commercial laboratory, laundry, metal fabricating operations, mortuary, swimming pool, morgue, x-ray equipment, medical office with laboratory, aspirator, medical washing equipment, packing house, plating plant, poultry house, power plant, nuclear reactor, those fire sprinkler systems equipped with facilities for introduction of freeze preventive chemicals or other substances other than water, dental office, any radioactive material, restaurant, beauty shops, shopping mall with tenant conducting any activity listed in this section and sewage pump or treatment facilities.
 - d. All installations described in **Sec. 5-04-05:5** of this code *shall* be deemed hazardous uses, and must have a containment device in the form of a reduced pressure zone backflow prevention device provided that, if the consumer demonstrates to the satisfaction of the cross connection coordinator that sufficient internal confinement devices have been installed and tested. The cross connection coordinator may require that the consumer provide engineering drawings sealed by a professional engineer of installations within the premises, which provide complete internal protection against cross-connection as approved by the cross connection coordinator. Any such connection *shall* be considered an other connection for determining the type of containment device required. Each internal confinement device *shall* be one of the following, as approved by the (Person in Responsible Charge) or

his authorized representative: reduced pressure zone principle backflow prevention device, double check valve backflow prevention device, air gap, vacuum break-pressure type, or dual check valve. Each reduced pressure zone principal backflow prevention device serving as an internal confinement device shall have a mesh strainer immediately upstream of the inlet gate valve.

- e. No person *shall* fill any tanks or tankers which include the following: those containing pesticides, fertilizers, other toxic chemicals or residues, flush trucks, street sweepers, and nonpotable water tankers from a public water system except with an approved air gap fill or an approved reduced pressure backflow preventor properly installed on the tank or tanker or on the public water supply fill pipeline or hose.

6. **Other Connections:**

- a. Services to single family residential units, not otherwise required by this code to have other containment devices, may have a containment device in the form of an approved dual check valve on all such services which meters are applied more than ninety (90) days following the date of adoption of this ordinance, said dual check valves or other containment devices as required *shall* be installed by the owner's representative prior to the installation of the meter by the (Department of Public Works). On all such services for which meters have been applied prior to that date, said dual check valve shall be installed by the (Department of Public Works), provided that the Town reserves the right to charge the owner or occupant of any residence for the cost of said device and its installation. Maintenance of dual check valve containment devices installed in accordance with this section *shall* be conducted by the (Department of Public Works).
- b. All other connections to the public water supply of the Town *shall* have containment devices in the form of a double check valve backflow prevention device as set forth in **Sec. 5-04-05:6** of this code. This *shall* include water mains installed to Town standard, and with Town supervision, but which are not maintained by the Town, including but not limited to manufactured home parks, apartments, group housing projects, and other private distribution systems, or similar hazard potential as determined by the (Person in Responsible Charge), or his authorized representative. Private distribution systems *shall* be configured so as to provide looped mains, with two (2) or more containment devices on each building water service connection and at dead-end branch mains.

7. **Installation of Cont Other Connections:**

- a. The containment devices *shall* be located off street right-of-way on the water main side of any plumbing connections. When installed

in a building, the device *shall* be located on the service line immediately after its entrance into the building. Each containment and confinement device *shall* be installed in a location that is physically accessible for inspection and testing as determined by the cross-connection coordinator. Containment devices, which have been buried in the ground, do not satisfy the provisions of this code. Each reduced pressure principle zone device shall be installed such that flooding of the device is unlikely as determined by the Cross Connection Coordinator

- b. The (Person in Responsible Charge) *shall* maintain a list of approved manufacturers and models of hazard containment devices and drawings of standard installation, copies to be made available through the Office of the Director of Public Works. All reduced pressure zone principle backflow prevention devices and double check valve backflow prevention devices shall be approved by the Foundation for Cross Connection Control and Hydraulic Research. All vacuum breaks and dual check valve devices shall be approved by the American Society for Sanitary Engineers. All installations and materials shall conform to Town standards as set by the (Person in Responsible Charge).
 - c. In those cases in which containment and/or confinement devices have been previously installed by prior owners, the Town, or other parties, the responsibility for maintenance, testing, and replacement as applicable *shall* be with the consumer.
 - d. The cost of said means of containment, and any other plumbing modifications necessary and convenient thereto, and the testing and maintenance thereof is to be paid for by the consumer.
8. **New Construction**: All buildings, proposing to connect to the public water system of the Town receiving building permits, on or after the effective date of this ordinance, *shall* be equipped with an approved and tested as properly functioning backflow prevention device(s), as prescribed herein, prior to the issuance of a Certificate of Code Compliance for that building. If a building permit was issued for the building prior to the effective date of the Article, or a building permit was not required, the building *shall* be considered to be an existing building prior to the effective date, in accordance with Sec. 5-4-05:a2 of this code.
9. **Notification of Consumer**: Upon identification of a hazard, or hazard potential, as defined in Sec. 5-4-05:5 through Sec. 5-4-05:6 of this code, the cross connection coordinator, *shall* notify the consumer, of record, of the property on which the hazard exists of the following:

Location of Hazard
Nature of Hazard Observed
Date Hazard Observed
Section of Code Applicable
Requirements of Code

Such notification to be made by certified mail, with return receipt requested.

10. **Change in Nature of Use:** The (Person in Responsible Charge) *shall* be notified by the consumer the nature of use of the property changes so as to change the hazard classification of that property, as set forth in Sec. 05-4-05:5 through Sec. 05-4-05:6 of this code.

11. **Consumer Responsibilities:**

- a. The consumer *shall*, upon notification, as defined in Sec. 0-04-05:9 of this code, install the hazard containment device(s) as required within 90 days from the date of notification.
- b. Upon determination that a backflow prevention assembly is required to be installed on a customer's private water system, the customer will be notified in writing of the approved backflow prevention assembly which is required. On existing systems, the customer will have the following time periods within which to install the specified backflow prevention assembly.

Air-gap separation	30 days
Reduced pressure principle assembly (3/4" - 2")	30 days
Double check valve assembly (3/4" - 2")	30 days
Reduced pressure principle assembly (2-1/2" and larger)	60 days
Double check valve assembly (2-1/2" and larger)	60 days
Other approved backflow prevention assembly	30 days

- c. The (Person in Responsible Charge) may require the installation of the required backflow prevention assembly immediately or within a shorter time period than specified above if he determines that any condition poses an unreasonable threat of contamination to the public water supply system, all devices required for new construction shall be installed prior to occupancy. All new construction plans and specifications shall be made available to the (Person in Responsible Charge) for approval and to determine the degree of hazard, The (Person in Responsible Charge) shall be notified by the customer when the nature of the use of property changes so as to change the hazard classification of the property if necessary.
- d. The Town *shall* bear no liability for direct or consequential damages proximately caused by the discontinuance of service pursuant to this section.

12. **Testing and Maintenance of Devices:** The consumer at each property at which containment and/or confinement device(s) have been installed, except those with devices installed in accordance with

Sec.05-4-05:6a (a) of this code, shall have each containment and/or confinement device(s) **tested upon installation** and thereafter tested on an annual basis (at the cost of the customer), and perform any routine maintenance to such device every five (5) years, and provide the cross connection coordinator with a report of that inspection and work. The consumer *shall* cause such maintenance, or repairs to be made (at the cost of the customer), rendering the device fully operational. Failure of the consumer to perform that testing and maintenance *shall* be cause for the premises to be deemed an immediate public health hazard. The (Person in Responsible Charge) *may* immediately thereafter discontinue public water supply service to that premises and service *shall* not be restored until such devices have been rendered operational. Where the use of water is critical to the continuance of normal operations or protection of life, property, or equipment, duplicated containment or confinement devices shall be provided by the property owner to avoid the necessity of discontinuing water service to test or repair the device or devices. A customer must immediately notify the Town of Yadkinville if the customer has reason to believe that backflow has occurred from the customer's private water system to the public water system.

13. **Violations:**

- a. A written notice of violation shall be given to any person who is determined to be in violation of any provision of this ordinance.
- b. Such notice shall set forth the violation and the time period within which the violation must be corrected. The violation must be corrected within a reasonable time, as specified in the notice, not to exceed thirty (30) days from receipt of the set forth the violation and the time period violation must be corrected. The violation notice. If the (Person in Responsible Charge) determines that the violation is occurring on a customer's private water system and that such violation has created or contributed to the existence of an imminent hazard, the customer may be required to correct the violation immediately.
- c. Water service may be terminated to a customer if the customer fails to correct a violation or to pay any civil penalty or expense assessed under this section. Termination of water service will be without prejudice to the Town's ability to assert any other remedy available to the Town against the customer or any other person responsible for the violation.
- d. The violation of any provision of this ordinance shall subject the violator to a civil penalty. Each subsequent day that a violation listed in (I) - (iv) continues shall constitute a separate and distinct offense according to the following schedule:
 - i. Unprotected cross-connection involving a private water system which is an imminent hazard - \$1,000/day
 - ii. Unprotected cross-connection involving a private water system which is a high hazard - \$750/day

- iii. Unprotected cross-connection involving a private water system which is a moderate hazard - \$500/day
 - iv. Unprotected cross-connection for which no other civil penalty is prescribed - \$250/day
 - v. Each violation listed in (v) - (ix) shall be considered a onetime violation subject to the following schedule:
 - vi. Falsifying records which are required to be submitted by this ordinance - tester may be removed from the approved certified tester list and/or \$500
 - vii. Submitting incomplete records or failing to submit records which are required by this ordinance - tester may be removed from the approved certified tester list and/or \$250
 - viii. Failing to test backflow prevention assemblies as required - \$100
 - ix. Failing to maintain backflow prevention assemblies as required - \$100.
 - x. Any other violation of the provisions of this ordinance - \$100.
- e. The (Person in Responsible Charge) may increase any civil penalty assessed under this section by \$100 or fifty percent (50%) of the maximum civil penalty associated with the violation, whichever is greater, for a second violation of the same provision within a two year period, Water service may be terminated after a third violation of the same provision within a two year period. Any person violating any provision of this ordinance shall pay to the Town all expenses incurred by the Town in repairing any damage to the public water system caused in whole or in part by such violation and any expense incurred by the Town in investigating such violation. All such expenses are deemed to be a part of the civil penalty assessed with the violation.

Sec. 5-4-05. Limitation of Liability

The Town *shall* not be held liable, for any cause, for failure to detect any unit failing to operate adequately, or failure to identify any specific hazard, which *may* result in contamination of its public water supply, nor *shall* this ordinance diminish the responsibility of any property owner from whose property a contamination of the public water supply *may* originate.

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INTRODUCTION

This manual has been designed to give specifications as to what test procedures are to be used, approved test kits, approved backflow assemblies and their location of installation. It will also give a better understanding of the responsibilities of the customer, technicians, and purveyor.

The ultimate goal is to provide protection for the water systems operated by the purveyor and to provide the highest quality of drinking water possible to the free flowing tap. The participation of each customer properly installing and maintaining a backflow assembly is one more step in assuring that the public drinking water is safe and clean.

INSTALLATION

1. Before installation of any backflow prevention assembly, all proper authorities must be contacted to obtain specifications on the type of assembly to install, size, location and rights of way. Local authorities to consider are the Town of Yadkinville Backflow Administrator, Fire Marshall, Planning and Zoning Department, County Plumbing Inspector, Public Works and N.C. Department of Transportation.

2. (Note: All installations or replacements of a backflow prevention assembly must be done by a licensed plumber or a licensed utility contractor.) Installation of a backflow prevention assembly shall be installed on the outlet side of the meter service. If outside location is not possible, the Backflow Administrator may allow the assembly to be installed just inside the building.

3. Reduced Pressure Principle Assemblies (RPPA) shall be installed above ground in an approved enclosure. The relief port shall have a minimum clearance of twelve (12) inches or a maximum of thirty (30) inches to the concrete pad. If the assembly must be installed inside of the building the following clearance specifications must be met:

3/4" - 2" must have a minimum clearance of four (4) inches between the wall and shut off valves, a minimum of thirty (30) inches from the wall on the side utilizing the test cocks and a minimum of six (6) inches on the opposite side of the assembly. A minimum of four (4) inch floor drain shall be provided for the relief port.

3" - 10" must have a minimum clearance of eight (8) inches between the wall and shut off valves, a minimum of thirty (30) inches clearance on the side utilizing the test cocks and a twelve (12) inch minimum clearance on the opposite side of the assembly. The floor drain shall be sized in accordance with the manufacturer's flow chart for relief valve.

Outside installation will be required to have an ASSE1060 approved enclosure to prevent the assembly from vandalism and freezing. All structures must meet the revised 1060 code which states enclosures shall be designed and constructed to maintain a minimum internal temperature of 4 degrees C (40 degrees F) for a 24-hour period. The protective structure must provide easy access to the assembly by testing or removal. The structure must have adequate drainage provided by hinged door or drain ports. (See Drain Port Sizing Page 3) (Note: Wrapping the assembly with insulation is prohibited). If the structure is non-removable and must be entered in order to test or repair the assembly, the same minimum and maximum clearances that are specified for inside installation shall apply. All structures must be adequately secured to a permanent footing.

4. Double Check Valve Assemblies (DCVA) may be installed in an ASSE 1060 approved enclosure above ground or below ground in a vault. If a Double Check Valve Assembly is installed in a vault the size and clearance specifications are as follows:

- ¾" – 1" shall have a clearance of four (4) inches from end walls to ball valves, eight (8) inches clearance on the side utilizing the test cocks and four (4) inches on the opposite side. Installation may be in a box that meets requirements in the Standard Detail Drawing (refer to drawings on pages 1-13).
- 2" shall be installed in a sealed vault. Such vault shall have positive drainage by gravity to the surface of ground or a catch basin connected to a storm drainage system. The drainage pipe shall be provided with a vermin screen installed. If drainage can not be provided the assembly unit must be installed above ground in ASSE 1060 approved enclosure. The 2" (DCVA) shall have a clearance of (4) four inches from the end walls to ball valves, twelve (12) inches minimum clearance on the test side of the assembly and six (6) inches minimum clearance on the opposite side.
- 3" – 10" (DCVA) shall have a clearance of eight (8) inches from the end walls to the ball valves, thirty (30) inches clearance on the test side of the assembly and twelve (12) inches clearance on the opposite side. All Double Check Valve Assemblies are required to have a minimum of twelve (12) inches to a maximum thirty (30) inches clearance from floor level to underside of body (refer to drawings on pages 1-13).

(Note: Fire line services utilizing pumps or of a high hazard shall have a Reduce Pressure Principal Detector Assembly installed. All others will require a Double Detector Check Valve Assembly. **All fire line backflow assemblies installed above ground shall have heat within protective housing.**)

***FOR ANY DISCREPANCIES, DRAWINGS TAKE PRIORITY*.**

5. A residential lawn irrigation system tapped off the public water main shall have a backflow prevention assembly located behind the meter service. Any irrigation line tapped off the residential domestic line shall have a backflow prevention assembly on the irrigation line before any branch of the system.

DRAIN PORT REQUIREMENTS

RP Size	Rectangular Opening (in.)	Circular Opening (dia.)
¾" – 1"	2 ½ h X 5 w	(1) - 4"
2"	3 h X 6 ½ w	(2) - 4"
3"	4 h X 7 w	(3) - 4"
4" – 6"	5 h X 10 w	(4) - 4"
8" – 10"	5 h X 20 w	N/A

APPROVED ASSEMBLIES AND MATERIAL SPECIFICATIONS

1. All backflow prevention assemblies must meet the requirements of the Town of Yadkinville and have National approvals from the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCHR), The American Society of Sanitary Engineering (ASSE) and must conform to AWWA C506, and adhere to ANSI and ASTM standards. All assemblies installed on fire lines shall have approval by Factory Mutual Systems (FM).

2. All internal parts must be replaceable in line.

3. All assemblies must have four (4) resilient seated test cocks, having 1/4 turn ball valves with slotted or lever type operators. These test cocks shall be located in the following order:

- a. 1st test cock: Before the first shut-off valve.
- b. 2nd test cock: Between the first shut-off valve and the 1st check valve.
- c. 3rd test cock: Between the first and second check valve.
- d. 4th test cock: Between the second check valve and the second shut-off valve.

4. All 3/4" - 2" backflow assemblies must have bronze or stainless steel bodies and bonnets and must be equipped with full port shut-off valves, of line size, having 1/4 turn lever type bronze or steel ball valves.

5. All 3" - 10" backflow assemblies shall have contained check valve modules. The bodies and bonnets must be made of one of the following: fusion bonded epoxy-coated cast iron, ductile iron or steel, or made of bronze or stainless steel.

All 3" - 10" backflow assemblies must be equipped with manufactured approved resilient seated gate, wedge or ball valves with non-rising stems. The valves should have a manual hand wheel for operation.

6. Only a backflow prevention device with USCFCCHR approved gate valves located on the inlet and outlet side of a particular manufacture and model will be considered a complete approved assembly by the Town of Yadkinville. Residential Check Valves will be exempt from these requirements.

7. If a backflow assembly is not on the approved list it may be submitted for review and approval by the Backflow Administrator. The Town of Yadkinville shall have the right to remove any assembly from the approved list if it fails to operate in a satisfactory manner or no longer meets specifications.

APPROVED DOUBLE CHECK VALVE ASSEMBLIES

AMES	2000	1/2 - 10 INCH (SS AND DCA)
CONBRACO	40-100	1/2 - 10 INCH
FEBCO	805Y	3/4 - 10 INCH
	850	1/2 - 8 INCH
	870	2 1/2 - 8 INCH
FLOMATIC	DCV	3/4 - 8 INCH
WATTS	007QT	1/2 - 2 INCH
	775QT	1/2 - 1 INCH
	007NRS	2 1/2 - 3 INCH
	709NRS	2 1/2 - 10 INCH
	774NRS	4 - 8 INCH
	774XNRS	6 & 8 INCH
WILKINS	350	4 & 6 INCH
	450	4 & 6 INCH (N SHAPE)
	950	4 - 10 INCH

APPROVED REDUCE PRESURE ZONE ASSEMBLIES

AMES	4000	1/2 - 10 INCH (SS AND DCA)
FEBCO	825	3/4 - 10 INCH
	860	1/2 - 8 INCH
	880	2 1/2 - 10 INCH (N AND Z SHAPE)
FLOMATIC	RPZ	1/2 - 8 INCH
WATTS	009QT	1/2 - 2 INCH
	095QT	1/2 - 1 INCH
	909QT	3/4 - 2 INCH
	009NRS	2 1/2 - 3 INCH
	909 NRS	2 1/2 - 10 INCH
	994NRS	4 & 6 INCH
WILKINS	375	4 INCH
	975	1/2 - 10 INCH

**APPROVED DOUBLE CHECK DETECTOR ASSEMBLIES
FIRELINE**

AMES	3000S	2 - 10 INCH
CONBRACO	40-600	3 - 10 INCH
FEBCO	806DDCA	3 - 10 INCH
	856DDCA	2 1/2 - 8 INCH
	876DDCA	2 1/2 - 10 INCH (N AND Z SHAPE)
WATTS	007DCDA	2 - 3 INCH
	709DCDA	3 - 10 INCH
	774DCDA	4 - 10 INCH
	774XDCDA	6 & 8 INCH
WILKINS	350DCDA	4 & 6 INCH
	450DCDA	4 INCH
	950DCDA	2 1/2 - 10 INCH

**APPROVED REDUCE PRESSURE DETECTOR ASSEMBLIES
FIRELINE**

AMES	5000SS	4 - 10 INCH
CONBRACO	40-700	3 - 10 INCH
FEBCO	826RPDA	2 1/2 - 10 INCH
WATTS	909RPDA	2 1/2 - 10 INCH
WILKINS	975RPDA	2 1/2 - 10 INCH

TEST REQUIREMENTS

1. Upon complete installation of all backflow assemblies, the customer is responsible for having a certified backflow technician, approved by the Town of Yadkinville, to make all tests and repairs. A completed duplicate copy of all tests and repairs must be sent to the Backflow Administrator with in thirty (30) days of completion. The customer must maintain a file of these reports for no less than five (5) years.

Before beginning any tests or repairs on a fire protection system the customer will be responsible to notify all parties that could be effected by the shutting off of the water service during any procedurs (i.e. alarm company, insurance agents, local fire officials).

If an assembly is in need of repair before the annual test period, the customer will be responsible to have repairs made immediately by an approved backflow technician. Any repaired assembly must be tested upon completion of any repairs. All repair parts must be of a manufacture's approval.

APPROVED CERTIFIED TESTERS

Any person interested in testing backflow assemblies in the Town of Yadkinville must have a certification from an approved school providing certification in Backflow Prevention Testing and Cross-Connection Control. The following schools have been approved by the Town of Yadkinville:

Fayetteville Public Works Commission
P. O. Box 1089
Fayetteville, NC 28302
Mr. Ronnie West, Coordinator
(910) 678-7439

City of Raleigh
Department of Public Utilities
P. O. Box 590
Raleigh, NC 27602
Mr. Ben Yarborough, Coordinator

University of Southern California
Foundation for Cross-Connection Control and
Hydraulic Research School of Engineering
BHE 314 University Park MC-0231
Los Angeles, California 90089-0231
Mr. Paul H. Schwartz, P.E., Coordinator
(213) 743-2032

University of Florida
Center for Training Research and Education for
Environmental Occupations (TREEO)
3900 SW 63rd Boulevard
Gainesville, Florida 32608
(904) 392-9570

Charlotte – Mecklenburg Utility Department
System Protection Division Backflow Prevention
5100 Brookshire Boulevard
Charlotte, North Carolina 28216
Mr. Mark A. Krouse, Coordinator
(704) 391-5159

City of Durham
Environmental Resources Department
101 City Hall Plaza
Durham, NC 27701
Steve Bledsoe, Instructor
(919) 560-4194

2. All testers must also have a thorough understanding of the Town of Yadkinville Backflow Prevention Ordinance and adhere to test procedures for Double Check Valves and Reduce Pressure Principle Assemblies as listed in the current procedures from the University of Southern California Foundation for Cross-Connection and Hydraulic Research Manual of Cross-Connection Control.

A person wishing to be put on a list of approved testers for the Town of Yadkinville must provide the City with a request letter with their full name, address, phone number (between 8 am and 5 p.m.), the name of the school from which certification was obtained and certificate number.

3. All tests must be done using test kits approved by the Town of Yadkinville.

4. Full consent from the customer must be granted to the tester before any test procedures take place. The tester must make sure the customer can provide safety for life and property during the entire testing or repair procedure. Until these safety precautions have been met no tests shall be completed.

5. A tester will be required to report any improperly installed assembly or installed non-approved manufacture's parts. Falsification of any records by the tester will result in the immediate removal from the approved tester list and be subject to penalties set forth in the ordinance.

REQUIREMENTS FOR TEST KITS

All test kits used for testing backflow prevention assemblies shall meet the following requirements for approval by the Town of Yadkinville:

1. Must meet the requirements of the University of Southern California Foundation for Cross-Connection and Hydraulic Research standards for differential pressure gauges.
2. The Town of Yadkinville will require a calibration certificate (less than one year old) for each kit and re-calibration annually.
3. The test person must supply the Town of Yadkinville with the following information for each kit to be registered:

Manufacture of kit
Type of kit (Duplex/Differential)
Serial Number
Owner's Name, Address, and Phone
Date of Calibration

APPROVED TEST KITS

ITT BARTON	100 BFT
CONBRACO	40-200-TK
FEBCO	RP TK-1 (RPPA - ONLY)
MIDWEST	MODEL 830 RP
WATTS	MODEL TK-DP

REDUCED PRESSURE PRINCIPAL ASSEMBLY TEST PROCEDURES

PREP	<ul style="list-style-type: none"> Notify customer Inspect area Flush test cocks (open 4, 3, open then close 1, 2, close 3, 4) Install fittings Inspect test kit - close all needle valves
OBSERVE CV1	<ul style="list-style-type: none"> Attach high hose to test cock #2 Attach low hose to test cock #3 Open test cock #3 slowly then open low pressure bleed valve Open test cock #2 slowly then open high pressure bleed valve Close high pressure bleed valve Close low pressure bleed valve Close shut-off valve #2 Observe check valve 1 - (record as close tight or leaking)
RECORD RELIEF VALUE	<ul style="list-style-type: none"> Open high control valve two full turns Open low control valve slowly (no more than 1/4 turn) Record relief valve opening (greater or less than 2.0 psid) Close low control valve only
RECORD CV 2 LEAKS OR CLOSED TIGHT	<ul style="list-style-type: none"> Bleed bypass hose by opening bypass valve Loosely attach bypass hose to test cock #4 Close bypass valve Tighten bypass hose to test cock #4 open test cock #4 Reset gauge - (open and close low pressure bleed valve) Open bypass valve two full turns Observe whether relief valve drips Record check valve #2 as (closed tight or leaking)
<p>NOTE: TO POSITIVELY VERIFY THE CONDITION OF SHUT-OFF #2, WITH VENT VALVE STILL OPEN, CLOSE TC #2, IF SHUT-OFF IS LEAKING, THE GAUGE WILL FALL TO 0.0 PSI BUT THE RELIEF VALVE WILL NOT OPEN. IF GAUGE NEEDLE RISES, THEN SHUT-OFF #2 IS LEAKING AND THERE IS BACKPRESSURE IN THE CUSTOMER'S SYSTEM. IF SHUT-OFF #2 IS LEAKING VALUES FOR THE RELIEF VALVE AND BOTH CHECK VALVES ARE INACCURATE.</p> <p style="text-align: center;">**NOTE - BE PREPARED TO CLOSE VENT BY-PASS CONTROL VALVE**</p>	
RECORD CV1	<ul style="list-style-type: none"> Close bypass valve Open test cock #2 Reset gauge - (open and close low pressure bleed valve) Record check valve #1 differential (greater or less than 5.0 psid) Close test cocks 2, 3, and 4 Remove vent hose from test cock #4
RECORD CV2	<ul style="list-style-type: none"> Move low hose to test cock #4 Move high hose to test cock #3 Open test cock #4 slowly then open low pressure bleed valve Open test cock #3 slowly then open high pressure bleed valve Close high pressure bleed valve Close low pressure bleed valve Record check valve #2 differential (greater or less than 1.0 psid)
FINAL	<ul style="list-style-type: none"> Close test cocks - remove all equipment Open shut-off #2 slowly

REDUCED PRESSURE ASSEMBLY
TROUBLE SHOOTING

NOTE: Many problems can be corrected by cleaning the internal components. Carefully observe condition of components.

PROBLEM	MAY BE CAUSED BY
Relief valve discharges continuously	<ol style="list-style-type: none"> 1. Faulty 1st check valve 2. Faulty 2nd check valve with back-pressure condition 3. Faulty relief valve
Relief valve discharges intermittently	<ol style="list-style-type: none"> 1. Properly working assembly with back-siphonage condition 2. 1st check valve "buffer" is too small (example- less than 3.0 psi), with line pressure fluctuation 3. Water hammer
Relief valve discharges after #2 shut-off valve is shut (test #1)	<ol style="list-style-type: none"> 1. Normally indicates faulty 1st check valve <ol style="list-style-type: none"> A. Dirty or damaged disk B. Dirty or damaged seat
Relief valve would not open, differential on the gauge would not drop (test #1)	<ol style="list-style-type: none"> 1. Leaky #2 shut-off valve with flow through assembly.
Relief valve would not open, differential drops to zero (test #1)	<ol style="list-style-type: none"> 1. Relief valve stuck closed due to corrosion or scale 2. Relief valve sensing line(s) plugged
Relief valve opens too high (with sufficiently high 1 st check reading)	<ol style="list-style-type: none"> 1. Faulty relief valve <ol style="list-style-type: none"> A. Dirty or damaged disk B. Dirty or damaged seat
1 st check reading too low (less than 3.0 psi "buffer") (test #1 & #3)	<ol style="list-style-type: none"> 1. Dirty or damaged disk 2. Dirty or damaged seat 3. Guide members hanging up 4. Weak or broken spring
Leaky 2 nd check valve (back-pressure test) 2 nd check valve reading too low (differential test)	<ol style="list-style-type: none"> 1. Dirty or damaged disk 2. Dirty or damaged seat 3. Guide members hanging up 4. Weak or broken spring

Repair Note: Lubricants shall only be used to assist with the re-assembly of components, and **shall be non-toxic.**

DOUBLE CHECK VALVE ASSEMBLY TEST PROCEDURES
DIFFERENTIAL TEST METHOD

PREP

Notify customer
Inspect area
Flush all test cocks
Install fittings
Inspect test kit - close all needle valves

CV #1

Install vertical tube on test cock #3
Install compensating tee on test cock #2
Note: Test gauge and hoses must be at same height
Attach high hose to compensating tee installed on test cock #2
Open test cock #2 slowly
Open high pressure bleed valve - bleed air from gauge
Close high pressure bleed valve
Open test cock #3 to fill vertical tube
Close test cock #3
Close shut-off valve #2
Close shut-off valve #1
Open test cock #3
Note: Gauge must read 1.0 psi or greater to pass
Record value of check valve #1

CV #2

Close test cock #2 and test cock #3
Open shut-off valve #1
Remove vertical tube from test cock #3
Move high hose and compensation tee from test cock #2 to
test cock #3
Install vertical tube on test cock #4
Open test cock #3 slowly
Open high pressure bleed valve - bleed air from gauge
Close high pressure bleed valve
Open test cock #4 to fill tube
Close test cock #4
Close shut off valve #1
Open test cock #4
Note: Gauge must read 1.0 psi or greater to pass
Record value of check valve #2

FINAL

Close test cocks - remove all equipment
Open shut off valve #1
Open shut off valve #2 slowly

DOUBLE CHECK VALVE ASSEMBLY
DIFFERENTIAL TROUBLESHOOTING GUIDE

CHECK VALVE #1 LEAKING

IN TEST #1 WATER STOPS RUNNING OUT OF THE VERTICAL TUBE INSTALLED AT TEST COCK #3 AND THE GAUGE READING STABILIZED AT 0.0 PSID. THIS INDICATES A LEAKING CHECK VALVE #1.

CHECK VALVE #2 LEAKING

IN TEST #2 WATER STOPS RUNNING OUT OF THE VERTICAL TUBE INSTALLED AT TEST COCK #4 AND THE GAUGE READING STABILIZED AT 0.0 PSID. THIS INDICATES A LEAKING CHECK VALVE #2.

SHUT-OFF VALVE #1 LEAKING

IN TEST #1 WATER CONTINUOUSLY FLOWS FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #3. WITH THE COMPENSATING TEE INSTALLED ON TEST COCK #2 AND THE BLEED VALVE OPENED UNTIL THERE IS ONLY A SLIGHT DRIP FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #3. THIS INDICATES A LEAKING SHUT-OFF VALVE #1.

SHUT-OFF VALVE #2 LEAKING WITH PRESSURE

IN TEST #2 WATER CONTINUOUSLY FLOWS FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #4 WITH THE COMPENSATING TEE INSTALLED ON TEST COCK #3 AND THE BLEED VALVE FULLY OPEN. WATER CONTINUES TO FLOW FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #4. THIS INDICATES A LEAKING SHUT-OFF VALVE #2 WITH PRESSURE.

SHUT-OFF VALVE #2 LEAKING WITH NO PRESSURE

IN TEST #2 WATER LEVEL IN THE VERTICAL TUBE INSTALLED AT TEST COCK #4 DROPS WHEN TEST COCK #4 IS OPENED. THIS INDICATES A LEAKING SHUT-OFF VALVE #2 WITH NO PRESSURE.

CHECK VALVE #2 AND SHUT-OFF VALVE #2 LEAKING WITH PRESSURE

IN TEST #1 WATER CONTINUOUSLY FLOWS FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #4 WITH THE COMPENSATING TEE INSTALLED ON TEST COCK #2 AND THE BLEED VALVE FULLY OPEN. WATER CONTINUES TO FLOW FROM THE VERTICAL TUBE INSTALLED AT TEST COCK #3. THIS INDICATES A LEAKING CHECK VALVE #2 AND LEAKING SHUT-VALVE #2 WITH PRESSURE.

CHECK VALVE #2 AND SHUT-OFF VALVE #2 LEAKING WITH NO PRESSURE

IN TEST #1 WATER LEVEL IN THE VERTICAL TUBE INSTALLED AT TEST COCK #3 DROPS WHEN TEST COCK #3 IS OPENED. THIS INDICATES A LEAKING CHECK VALVE #2 AND LEAKING SHUT-OFF VALVE #2 WITH NO PRESSURE

PRESSURE VACUUM BREAKER TEST PROCEDURES

PREP

- Notify customer
- Inspect area
- Flush test cocks
- Install fittings
- Remove inlet air valve canopy
- Inspect test kit - close all needle valves

NOTE: MAKE SURE THAT ALL HOSES AND GUAGES ARE AT THE SAME ELEVATION AS THE PRESSURE VACUUM BREAKER

NOTE: DO NOT HAVE TEST KIT ATTACHED TO BACKFLOW PREVENTER WHEN OPENING #1 SHUT-OFF VALVE

AIR INJET VALVE

- Attach high side hose to test cock #2
- Open test cock #2 slowly
- Open high pressure bleed valve then close high pressure bleed valve
- Close #2 shut-off valve, then close #1 shut-off valve
- Slowly open high pressure bleed valve no more than 1/4 turn, until air inlet valve opens
- NOTE: Air inlet valve must open 1.0 psi or greater to pass**
- Record value of air inlet valve

CV

- Close test cock #2
- Remove high side hose from test cock #2
- Re-open #1 shut-off valve to repressurize the assembly
- Attach high side hose to test cock #1
- Open test cock #1 slowly
- Open high pressure bleed valve then close high pressure bleed valve
- Close #1 shut-off valve
- Open test cock #2 until water drains out of the body
- NOTE: To pass, test gauge must read 1.0 psi or greater when water stops flowing from test cock #2**
- Record value of check valve

FINAL

- Close test cocks 1 and 2 and remove test equipment
- Open #1 shut-off valve, then open #2 shut-off valve
- Replace air inlet valve canopy

PRESSURE VACUUM BREAKER
TROUBLE SHOOTING

NOTE: Many problems can be corrected by cleaning the internal components. Carefully observe condition of components.

PROBLEM	MAY BE CAUSED BY
Air inlet valve does not open, as gauge drops to 0.0 psid	<ol style="list-style-type: none"> 1. Air inlet disk stuck to seat 2. Broken or missing air inlet spring 3. "Old Style" pressure vacuum breaker (non-loaded air inlet valve)
Air inlet valve does not open, and differential on gauge will not drop	<ol style="list-style-type: none"> 1. Leaky #1 shut-off valve 2. Parallel installation with leaky #2 shut-off valve
Air inlet opens below 1.0 psid	<ol style="list-style-type: none"> 1. Dirty or damaged air inlet disk 2. Scale build up on seat
Check valve below 1.0 psid	<ol style="list-style-type: none"> 1. Dirty or damaged check disk 2. Damaged seat
Water runs continuously from test cock #2 (test #2)	<ol style="list-style-type: none"> 1. Leaky #1 shut-off valve

DOUBLE CHECK VALVE ASSEMBLY
TROUBLE SHOOTING

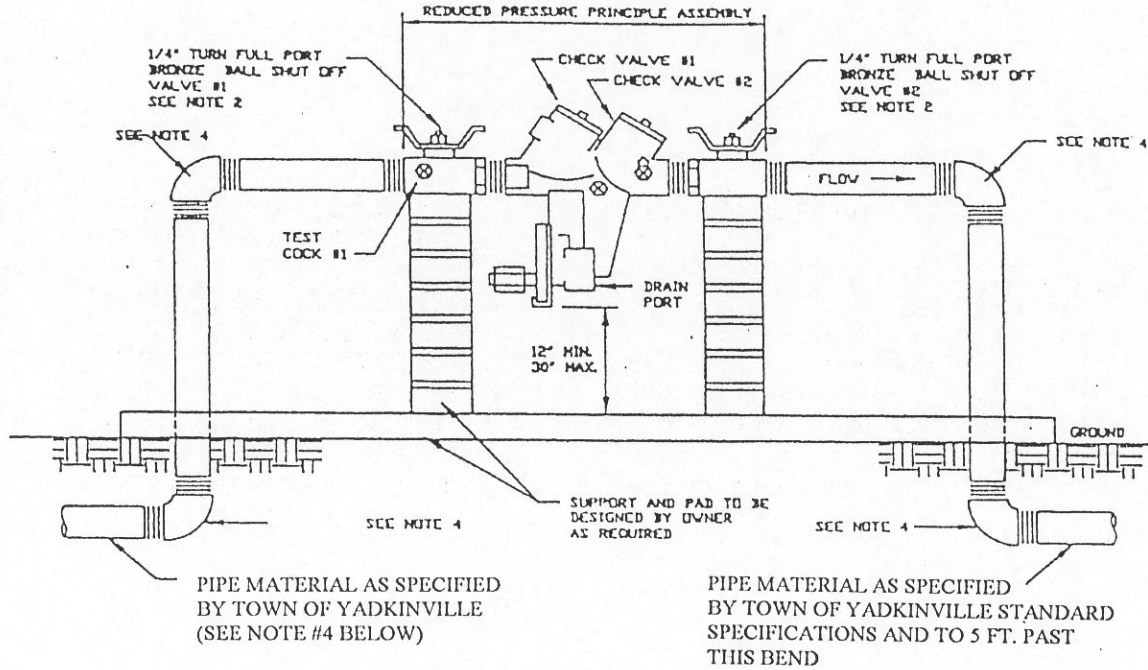
NOTE: Many problems can be corrected by cleaning the internal components. Carefully observe condition of components.

PROBLEM	MAY BE CAUSED BY
1 st check reading to low (test #1)	<ol style="list-style-type: none"> 1. Dirty or damaged disk 2. Damaged seat
2 nd check reading to low (test #2)	<ol style="list-style-type: none"> 3. Guide members hanging up 4. Weak or broken spring

Repair Note: Lubricants shall only be used to assist with the re-assembly of components, and shall be non-toxic.

STANDARD DETAIL BACKFLOW PREVENTION

REDUCE PRESSURE PRINCIPLE ASSEMBLY (RP) 3/4" - 2"



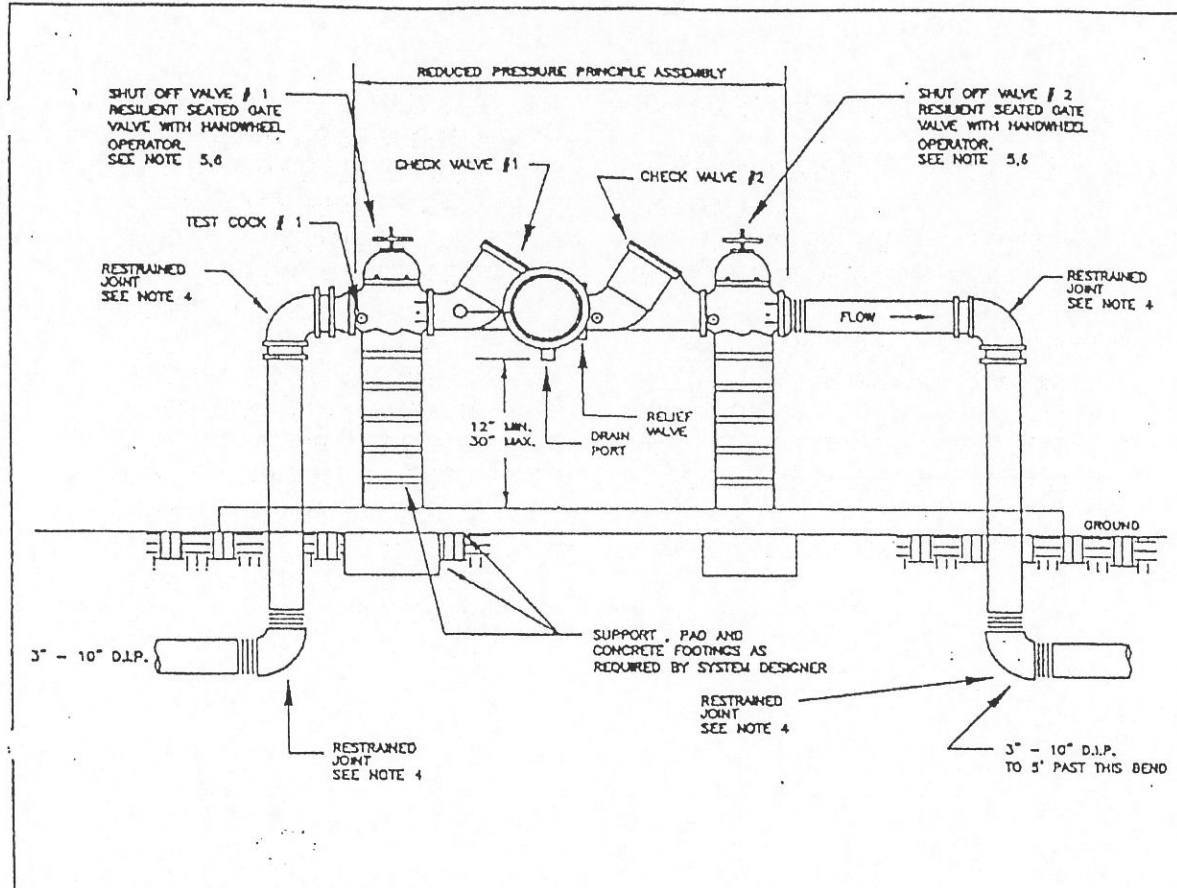
NOTES:

1. REDUCED PRESSURE PRINCIPLE ASSEMBLIES (RP) MUST CONFORM TO THE TOWN OF YADKINVILLE SPECIFICATIONS.
2. THE TOWN OF YADKINVILLE APPROVED 3/4" - 2" RP INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. IN OUTDOOR INSTALLATIONS, ENCLOSURES MUST BE ASSE1060 APPROVED OR GIVEN EQUAL PROTECTION FROM ELEMENTS AND OR VANDALISM.
4. MATERIAL INCLUDING PIPE/FITTINGS SHALL BE TOWN OF YADKINVILLE APPROVED INCLUDING BUT NOT LIMITED TO SCH 40, COPPER OR MATERIAL EQUAL TO OR GREATER QUALITY.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.

STANDARD DETAIL BACKFLOW PREVENTION

REDUCED PRESSURE PRINCIPLE ASSEMBLY (RP)

3" - 10"

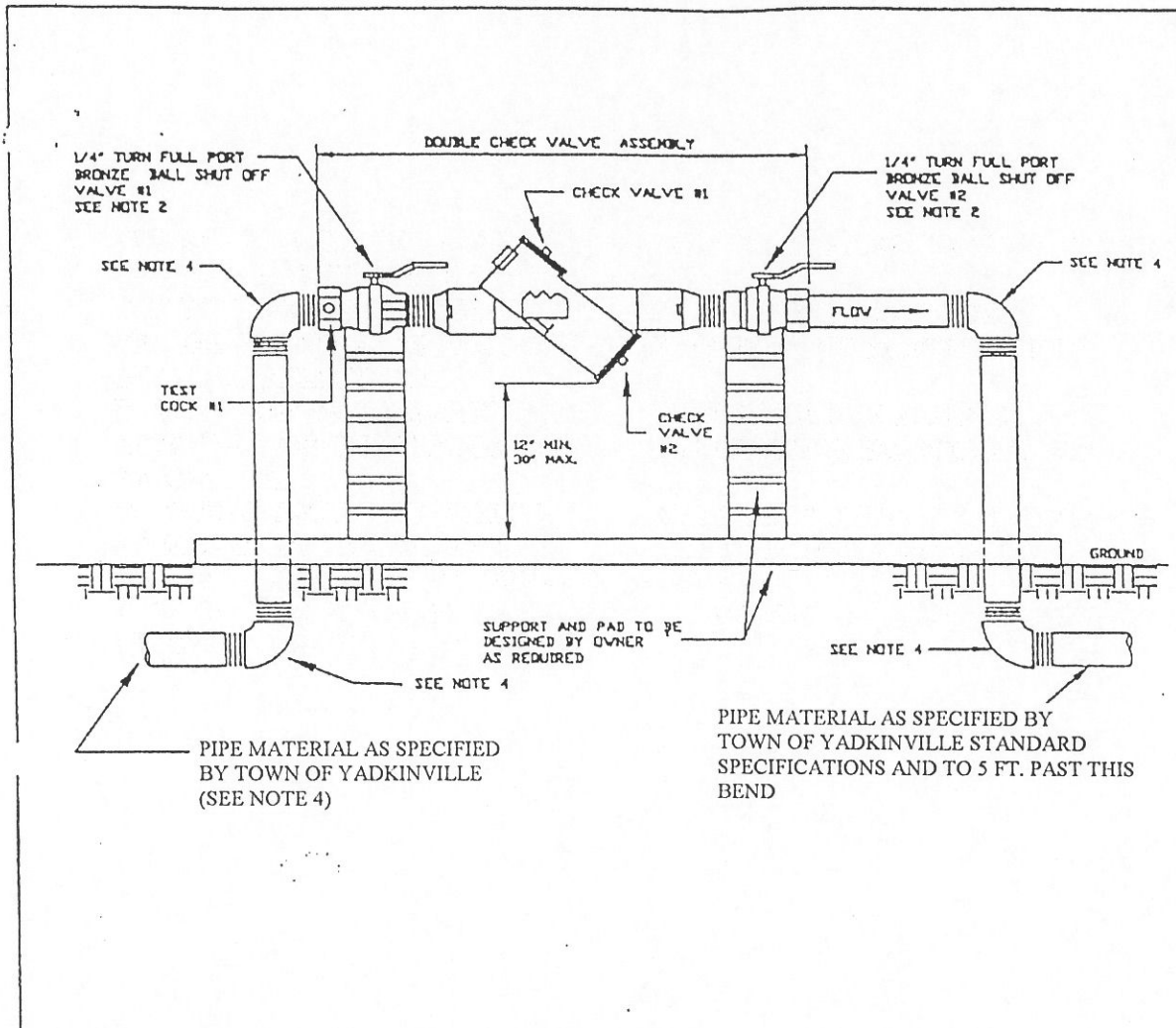


NOTES:

1. REDUCED PRESSURE ASSEMBLIES (RP) MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS.
2. 8" - 10" RP SHALL BE SUPPORTED AT CENTER WITH PEDESTAL AND SHALL NOT BLOCK RELIEF VALVE OR DRAIN PORT.
3. IN OUTDOOR INSTALLATIONS, ENCLOSURES MUST BE ASSE1060 APPROVED OR GIVEN EQUAL PROTECTION FROM ELEMENTS AND OR VANDALISM.
4. MATERIAL INCLUDING PIPE/FITTINGS SHALL BE TOWN OF YADKINVILLE APPROVED INCLUDING BUT NOT LIMITED TO SCH 40, COPPER OR MATERIAL EQUAL TO OR GREATER QUALITY.
5. THE TOWN OF YADKINVILLE APPROVED 3" - 10" RP INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
6. FIRE LINE SERVICES SHALL HAVE OUTSIDE STEW AND YOKE (OS & Y) HANDWHEEL OPERATORS.
7. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3/4" - 2" ABOVE GROUND

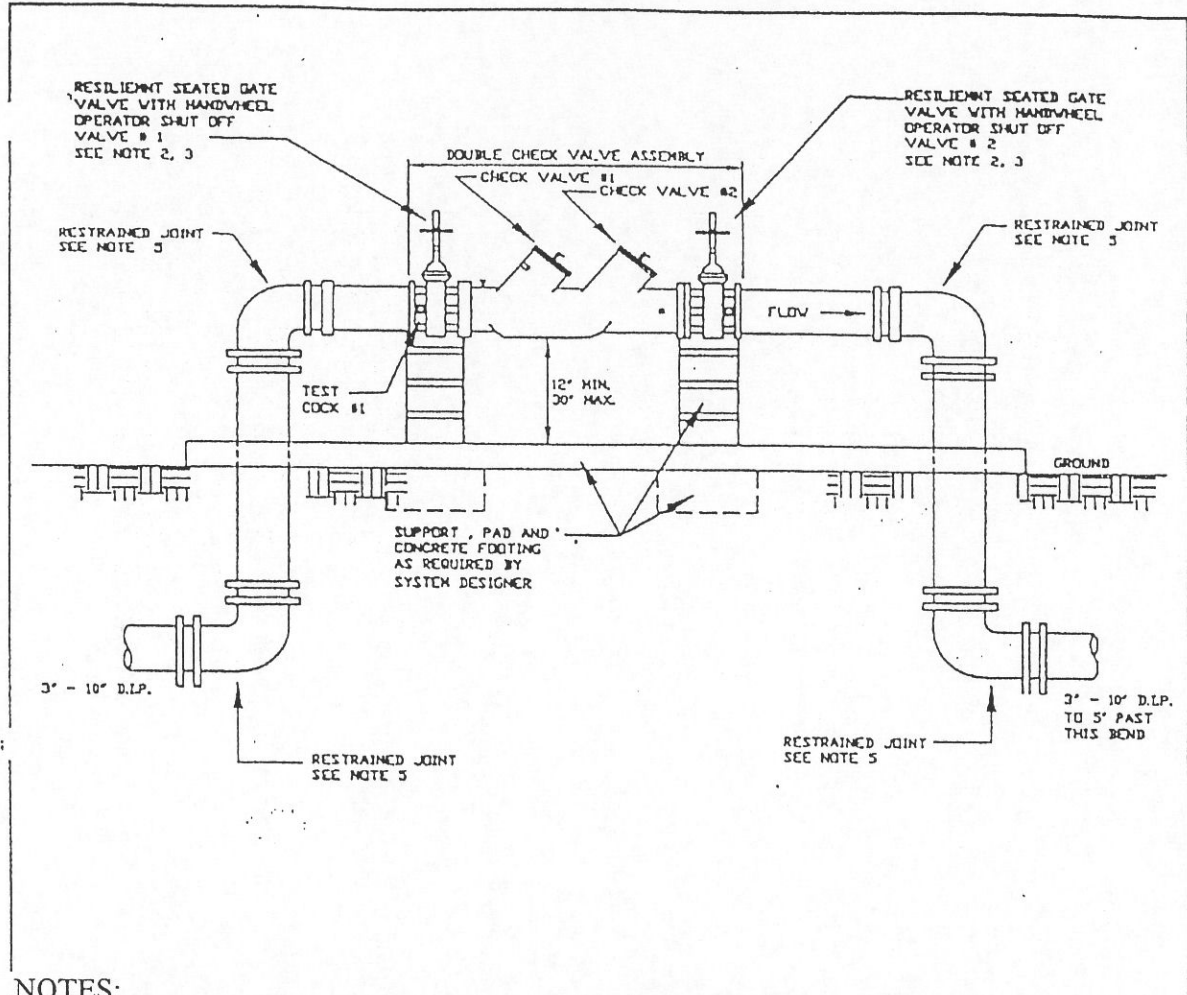


NOTES:

1. THE DOUBLE CHECK VALVE ASSEMBLIES (DCVA) MUST CONFORM TO THE TOWN OF YADKINVILLE SPECIFICATIONS.
2. THE TOWN OF YADKINVILLE APPROVED 3/4" - 2" DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. IN OUTDOOR INSTALLATIONS, ENCLOSURES MUST BE ASSE1060 APPROVED OR GIVEN EQUAL PROTECTION FROM ELEMENTS AND OR VANDALISM.
4. MATERIAL INCLUDING PIPE/FITTINGS SHALL BE TOWN OF YADKINVILLE APPROVED INCLUDING BUT NOT LIMITED TO SCH 40, COPPER OR MATERIAL EQUAL TO OR GREATER QUALITY.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE ASSEMBLY.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3" - 10" ABOVE GROUND

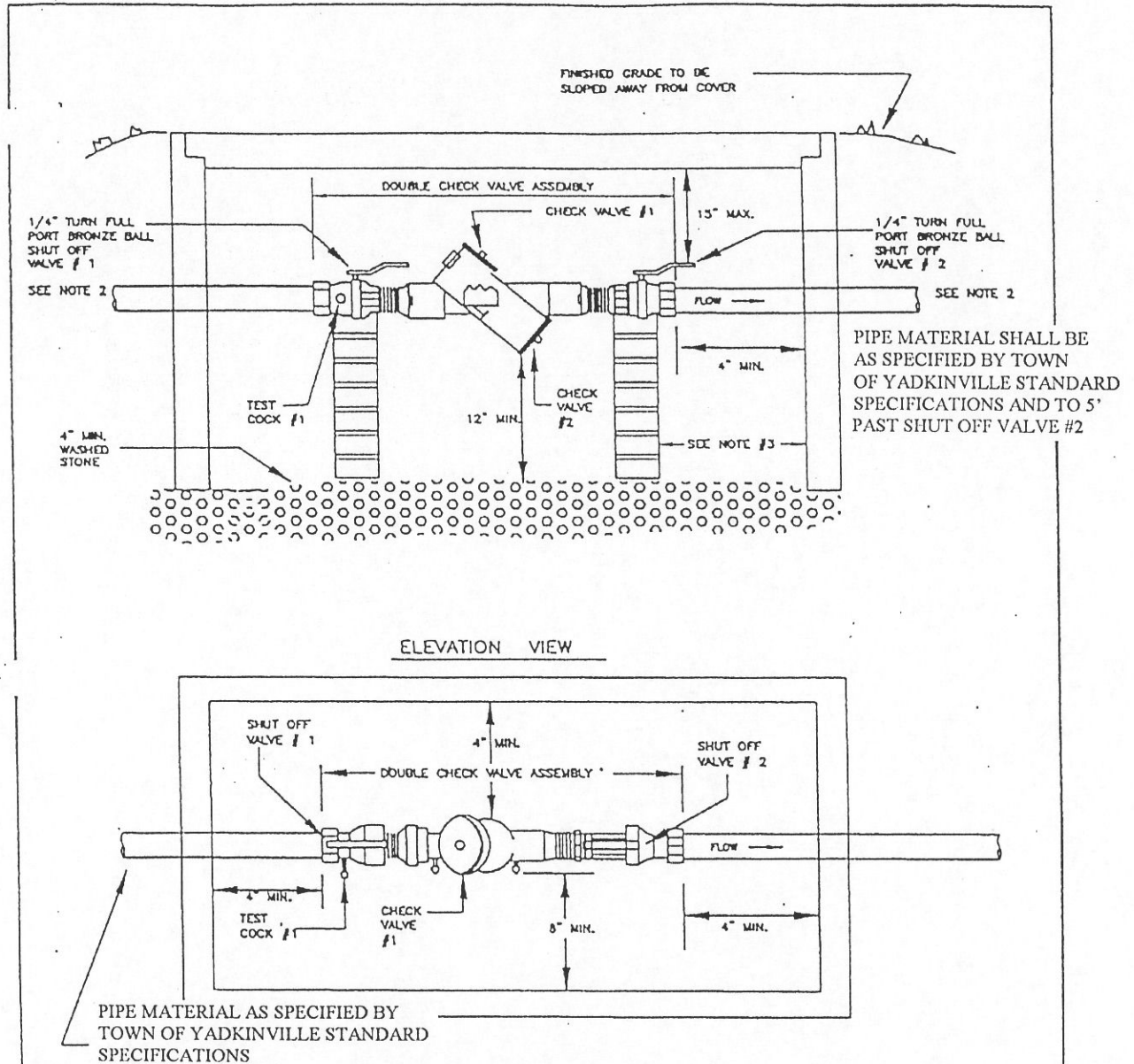


NOTES:

1. THE DOUBLE CHECK VALVE ASSEMBLIES (DCVA) MUST CONFORM TO THE TOWN OF YADKINVILLE SPECIFICATIONS.
2. THE TOWN OF YADKINVILLE APPROVED DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. FIRE LINE SERVICES SHALL HAVE OUTSIDE STEM AND YOKE (OS & Y) HANDWHEEL OPERATORS.
4. 8" - 10" DCVA SHALL BE SUPPORTED AT CENTER WITH PEDESTAL.
5. RESTRAINED JOINTS SHALL BE WITH MEGA LUG RESTRAINTS OR APPROVED EQUAL.
6. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.
7. IN OUTDOOR INSTALLATIONS, ENCLOSURES MUST BE ASSE1060 APPROVED OR GIVEN EQUAL PROTECTION FROM ELEMENTS AND OR VANDALISM.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3/4" & 1" VAULT

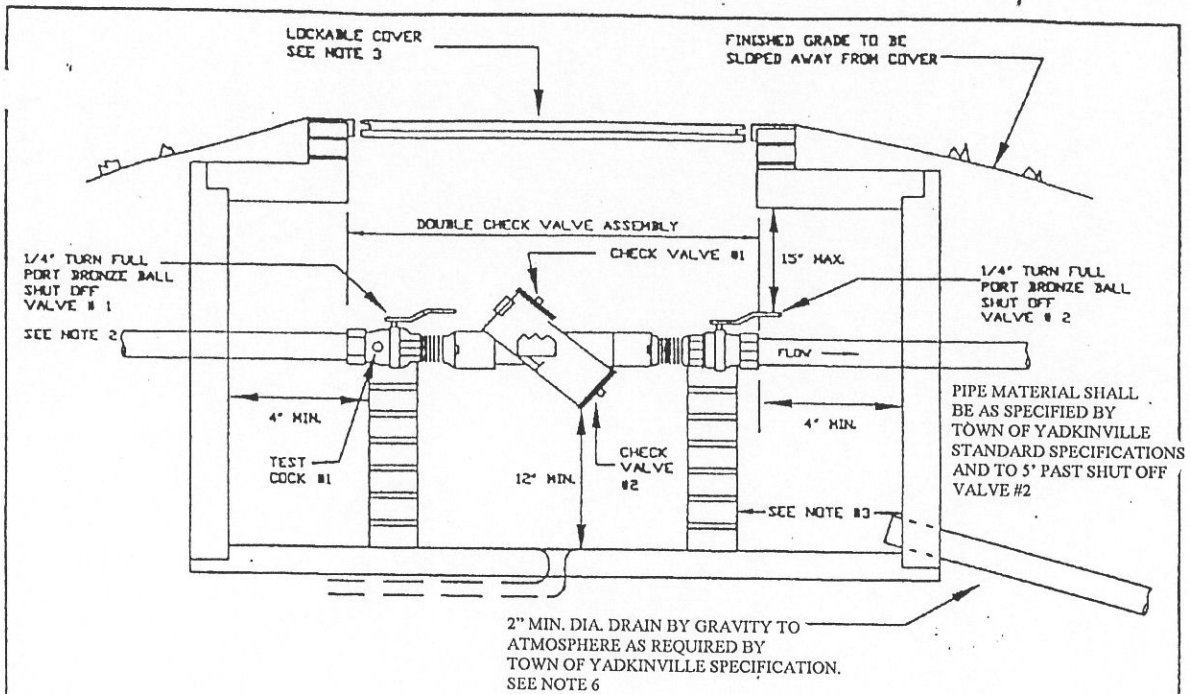


NOTES:

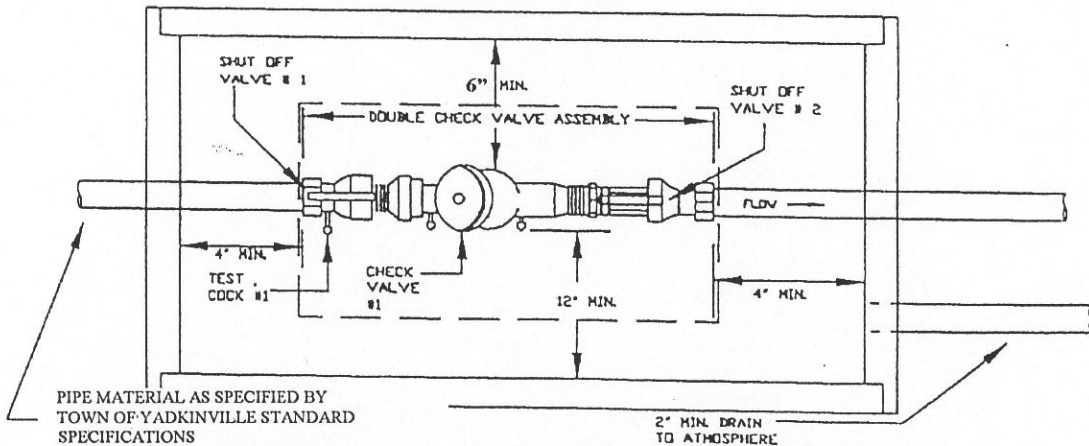
1. DCVA MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS FOR BACKFLOW PREVENTION ASSEMBLIES 3/4" & 1".
2. THE TOWN OF YADKINVILLE APPROVED DCVA'S INCLUDE SHUT OFF VALVES #1 AND #2. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. VAULT, DOORS OR COVERS AND SUPPORT OF ASSEMBLY SHALL BE DESIGNED BY OWNER AND AS REQUIRED.
4. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS TO BE PART OF THE APPROVED ASSEMBLY. ALL TEST COCKS MUST BE ON THE SIDE OR TOP. ASSEMBLIES SHALL BE INSTALLED UPRIGHT AND IN THE HORIZONTAL POSITION.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 2" VAULT



ELEVATION VIEW

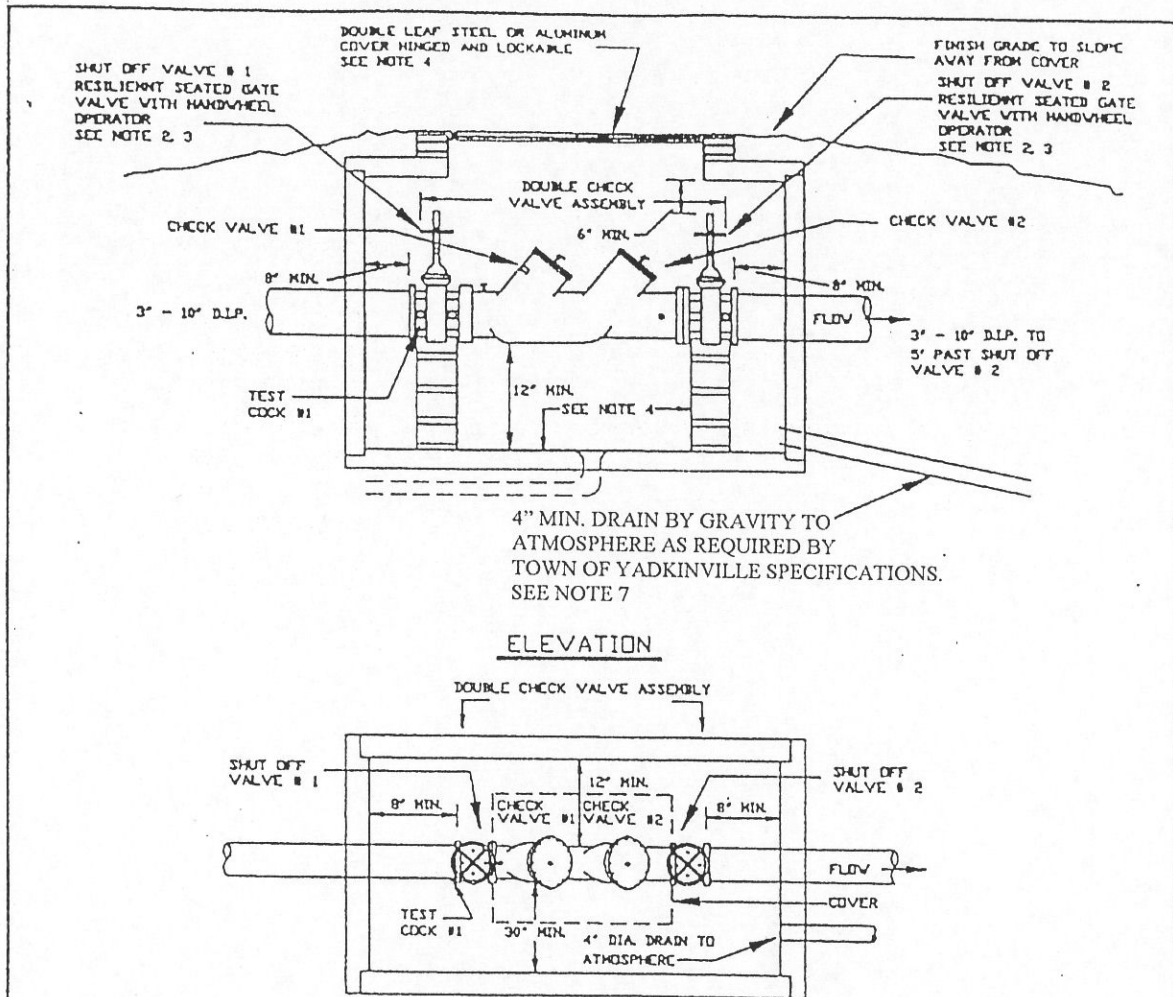


NOTES:

1. DCVA MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS FOR BACKFLOW PREVENTION ASSEMBLIES 1-1/2" AND 2".
2. TOWN OF YADKINVILLE APPROVED DCVA'S INCLUDE SHUT OFF VALVES #1 AND #2. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. VAULT, DOORS OR COVERS AND SUPPORT OF ASSEMBLY SHALL BE DESIGNED BY OWNER AND AS REQUIRED.
4. IF DRAINAGE CANNOT BE PROVIDED TO FREE ATMOSPHERE OR STORM DRAINAGE, THE DCVA'S SHALL BE INSTALLED ABOVE GROUND.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS TO BE PART OF THE APPROVED ASSEMBLY. ALL TEST COCKS MUST BE ON THE SIDE OR TOP. ASSEMBLIES SHALL BE INSTALLED UPRIGHT AND IN THE HORIZONTAL POSITION.
6. DRAIN MAY BE PROVIDED AS SHOWN OR AS FLOOR DRAIN.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3" - 10" VAULT

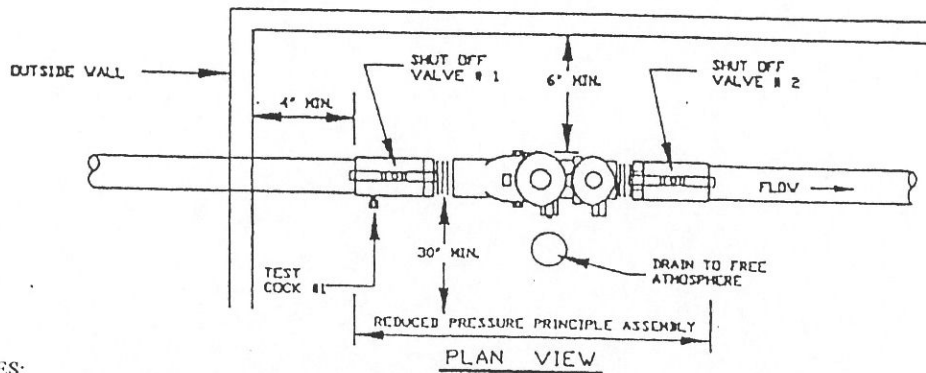
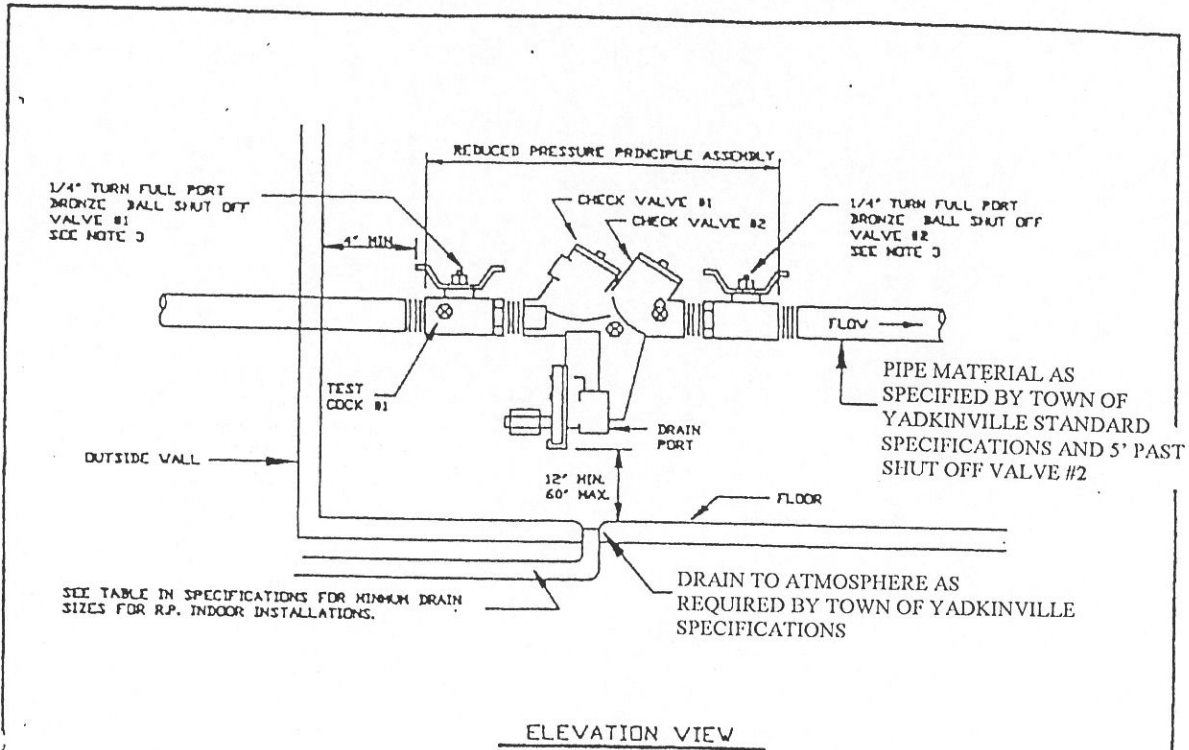


NOTES:

1. DCVA'S MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS.
2. TOWN OF YADKINVILLE APPROVED DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE UNIT. NO SUBSTITUTIONS SHALL BE PERMITTED. 6" CLEARANCE SHALL BE WITH VALVE OPEN.
3. FIRE LINE INSTALLATIONS SHALL HAVE OUTSIDE STEM AND YOKE (OS & Y) HANDWHEEL OPERATORS.
4. VAULT, DOORS OR COVERS AND SUPPORT OF ASSEMBLY SHALL BE DESIGNED BY OWNER AS REQUIRED.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE ASSEMBLY.
6. IF DRAINAGE CANNOT BE PROVIDED TO FREE ATMOSPHERE OR STORM DRAINAGE, THE DCVA SHALL BE INSTALLED ABOVE GROUND.
7. DRAINAGE MAY BE PROVIDED AS SHOWN OR AS FLOOR DRAIN.

STANDARD DETAIL BACKFLOW PREVENTION

REDUCE PRESSURE PRINCIPLE ASSEMBLY (RP) 3/4" - 2" INDOOR

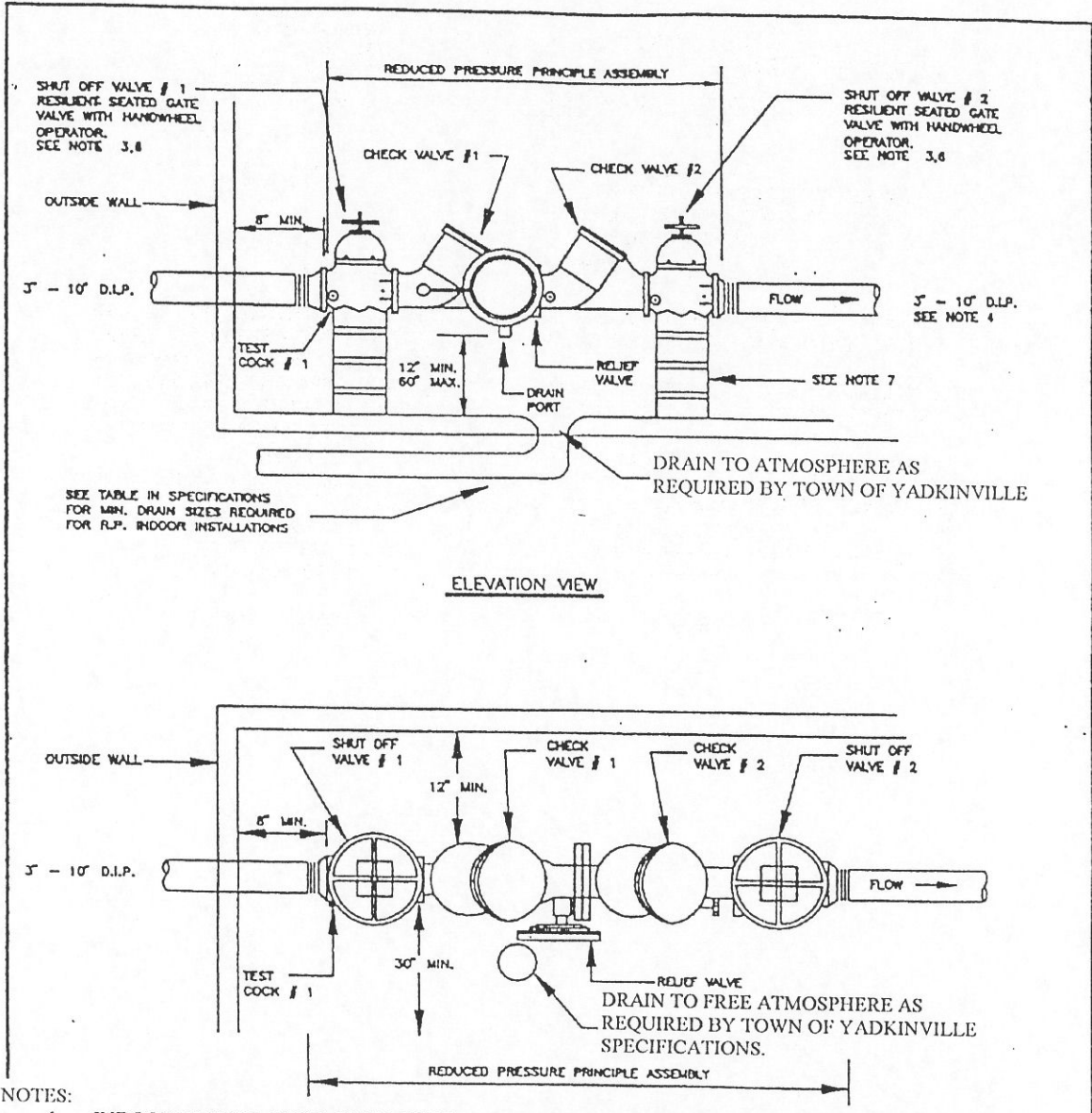


NOTES:

1. INDOOR INSTALLATION SHALL BE PERMITTED IN CASES WHERE ADEQUATE SPACE FOR THE BACKFLOW PREVENTION ASSEMBLY IS NOT AVAILABLE OUTSIDE. TOWN OF YADKINVILLE SHALL REVIEW ON A CASE BY CASE BASIS.
2. THE 3/4" - 2" RP MUST CONFORM TO TOWN OF YADKINVILLE STANDARDS FOR BACKFLOW PREVENTION ASSEMBLIES.
3. TOWN OF YADKINVILLE APPROVED 3/4" - 2" RP INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
4. SUPPORT FOR ASSEMBLY SHALL BE DESIGNED BY OWNER AS REQUIRED.
5. AN AIR-GAP DRAIN IS RECOMMENDED TO REDUCE SPLASHING OF MINOR DISCHARGE FROM THE RELIEF VALVE DRAIN PORT.
6. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY. ALL TEST COCKS MUST BE ON THE OUTSIDE OR TOP. ASSEMBLIES SHALL BE INSTALLED UPRIGHT AND IN THE HORIZONTAL POSITION.

STANDARD DETAIL BACKFLOW PREVENTION

REDUCED PRESSURE PRINCIPLE ASSEMBLY (RP) 3" - 10" INDOOR

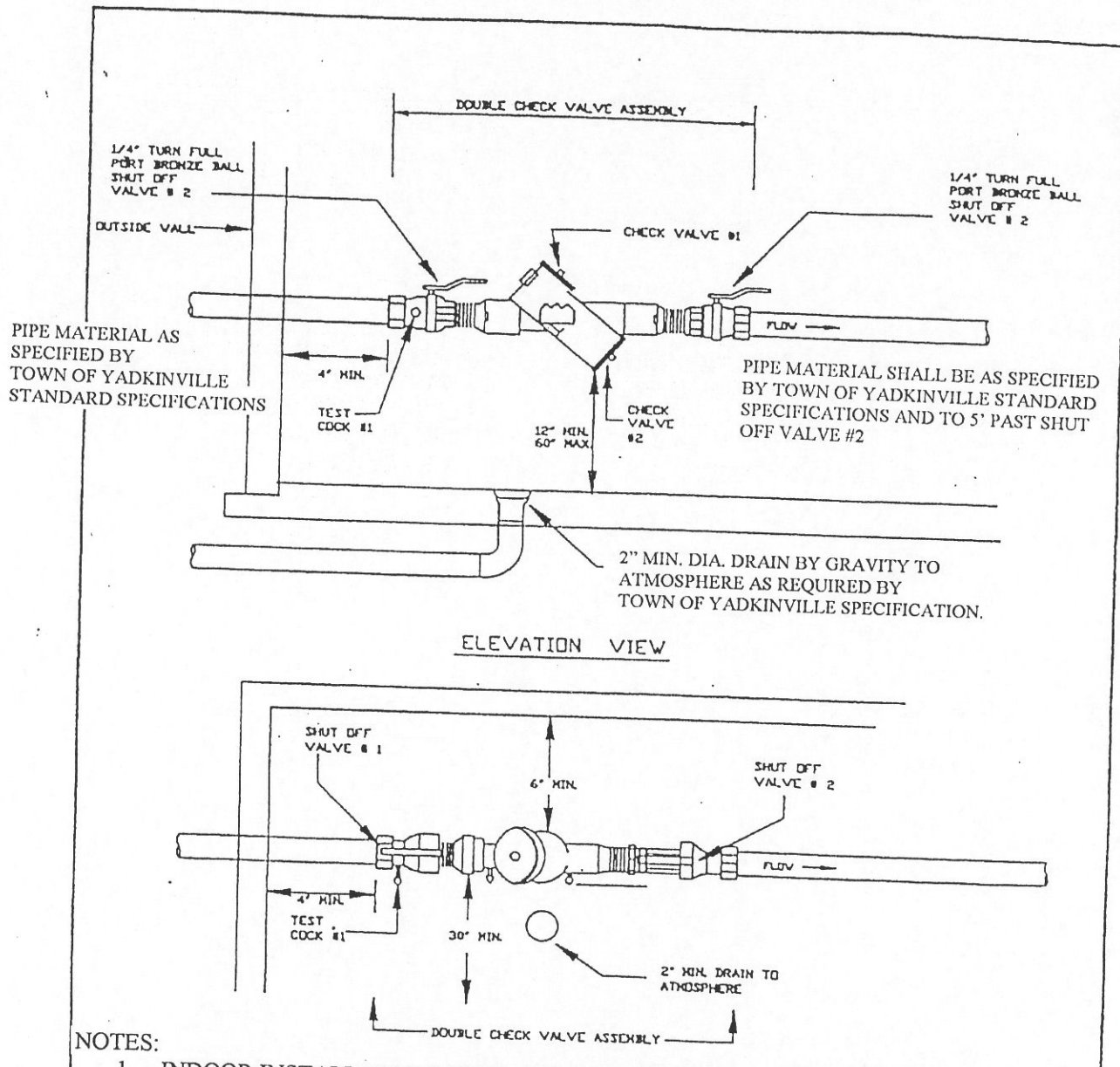


NOTES:

1. INDOOR INSTALLATION SHALL BE PERMITTED IN CASES WHERE ADEQUATE SPACE FOR THE BACKFLOW PREVENTION ASSEMBLY IS NOT AVAILABLE OUTSIDE. TOWN OF YADKINVILLE SHALL REVIEW ON A CASE BY CASE BASIS.
2. REDUCED PRESSURE ASSEMBLIES (RP) MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS.
3. THE TOWN OF YADKINVILLE APPROVED 3" - 10" RP INCLUDES SHUT OFF VALVES #1 AND #2. NO SUBSTITUTIONS SHALL BE PERMITTED.
4. ALL PIPE 3" - 10" SHALL BE DIP FROM THE TAP AT THE MAIN TO 5' PAST SHUT OFF VALVE #2.
5. RESTRAINED JOINTS SHALL BE WITH MEGA LUG RESTRAINTS, OR APPROVED EQUAL.
6. FIRE LINE INSTALLATION SHALL HAVE OUTSIDE STEM AND YOKE (OS & Y) HANDWHEEL OPERATOR.
7. SUPPORT OF 3" - 10" RP SHALL BE DESIGNED BY OWNER. IT IS RECOMMENDED 3" - 10" RP BE SUPPORTED AT CENTER. THE SUPPORT SHALL NOT BE UPSTREAM OF SHUT OFF VALVE #1.
8. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.
9. AN AIR-GAP DRAIN IS RECOMMENDED TO REDUCE SPLASHING OF MINOR DISCHARGE FROM RELIEF VALVE DRAIN PORT.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3/4" - 2" INDOOR

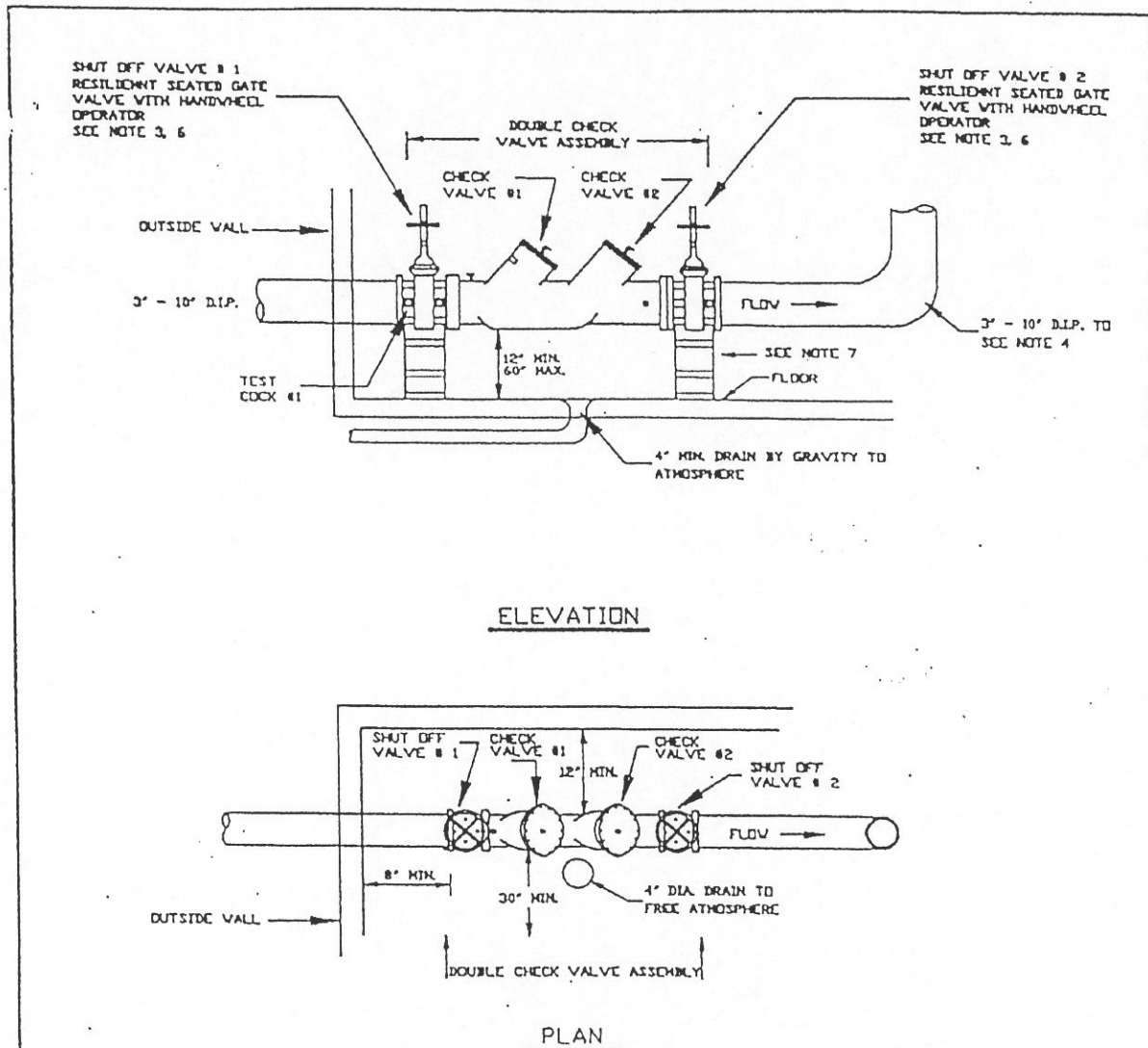


NOTES:

1. INDOOR INSTALLATION SHALL ONLY BE PERMITTED IN CASES WHERE ADEQUATE SPACE FOR THE BACKFLOW PREVENTION ASSEMBLY IS NOT AVAILABLE OUTSIDE. TOWN OF YADKINVILLE WILL REVIEW ON A CASE BY CASE BASIS.
2. DCVA MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS FOR BACKFLOW PREVENTION ASSEMBLIES 3/4" - 2".
3. TOWN OF YADKINVILLE APPROVED DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS.
4. SUPPORT OF BACKFLOW PREVENTION ASSEMBLY SHALL BE DESIGNED BY OWNER AS REQUIRED.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE ASSEMBLY.

STANDARD DETAIL BACKFLOW PREVENTION

DOUBLE CHECK VALVE ASSEMBLY (DCVA) 3" - 10" INDOOR

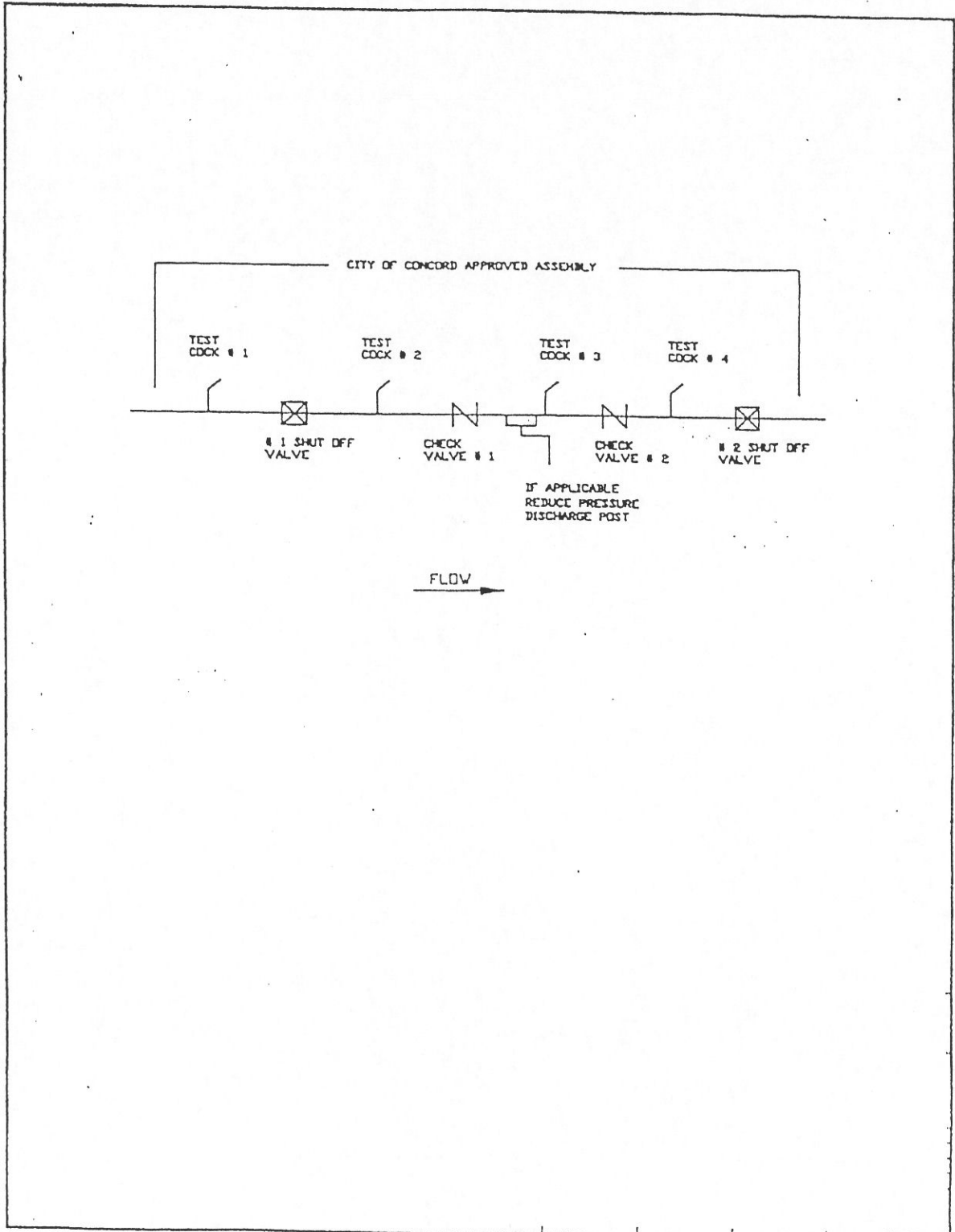


NOTES:

1. INDOOR INSTALLATION SHALL BE PERMITTED IN CASES WHERE ADEQUATE SPACE IS NOT AVAILABLE OUTSIDE. TOWN OF YADKINVILLE WILL REVIEW ON A CASE BY CASE BASIS.
2. DCVA MUST CONFORM TO TOWN OF YADKINVILLE SPECIFICATIONS.
3. TOWN OF YADKINVILLE APPROVED DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE ASSEMBLY. NO SUBSTITUTIONS SHALL BE PERMITTED.
4. ALL PIPE 3" - 10" SHALL BE DIP FROM THE TAP AT THE MAIN TO 5' PAST SHUT OFF VALVE #2.
5. RESTRAINED JOINTS SHALL BE WITH MEGA LUG RESTRAINTS OR APPROVED EQUAL.
6. FIRE LINE INSTALLATIONS SHALL HAVE OUTSIDE STEM AND YOKE (OS & Y) HANDWHEEL OPERATORS.
7. SUPPORT OF 3" - 10" DCVA SHALL BE DESIGNED BY OWNER. IT IS RECOMMENDED 3" - 10" DCVA BE SUPPORTED AT CENTER.
8. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE APPROVED ASSEMBLY.

STANDARD DETAIL BACKFLOW PREVENTION

TEST COCK LOCATION



STANDARD DETAIL BACKFLOW PREVENTION

TANKER TRUCKS (AIR GAP & RP)

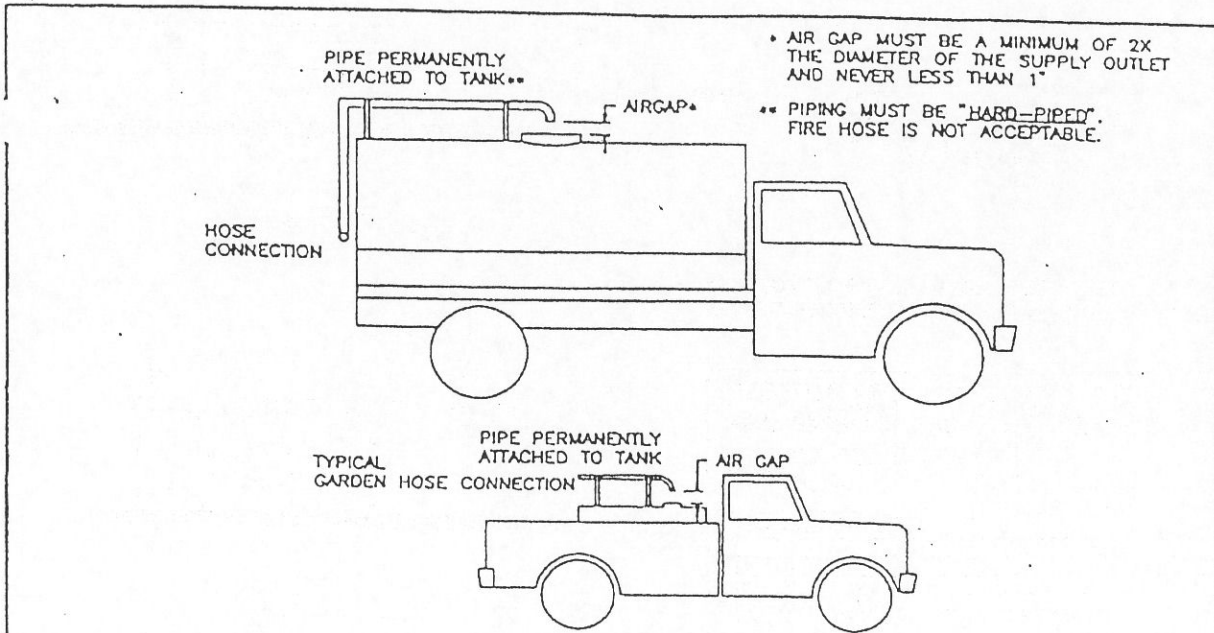
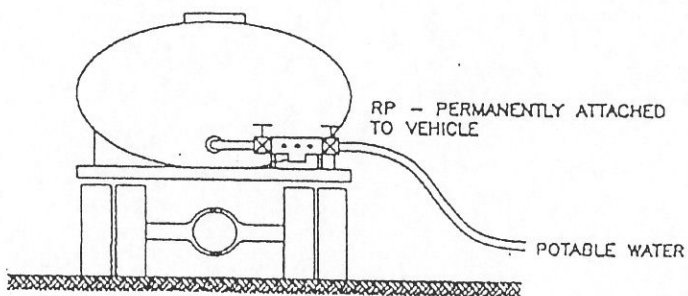


FIGURE A - AIR GAP



NOTE:
ALL TANKS SHALL SUPPLY A GALLON REGISTER METER OF SAME PIPE DIAMETER

RP = TOWN OF YADKINVILLE APPROVED.
REDUCE-PRESSURE PRINCIPLE ASSEMBLY

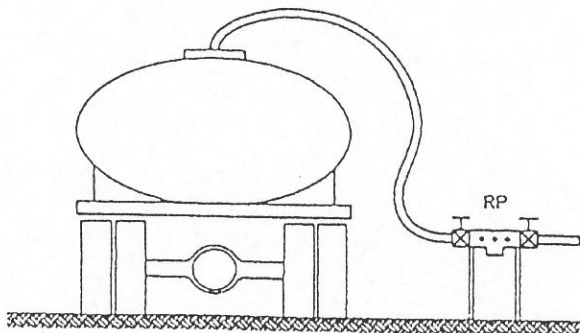


FIGURE B - RP

		STANDARD DETAIL BACKFLOW PREVENTION	
		TANKER TRUCKS (AIR GAP & RP)	
<i>a city meeting the future...</i>			
3/20/96		Meter Note	
No.	Date	By	REVISION
Drawn By:	Checked By:	Approved By:	Date
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