



City Of Kingsport Water Services Division Backflow Prevention Requirements

The Tennessee Department of Environment and Conservation Bureau of Environment Division of Water Supply Rule 1200-5-1.17 (6), places the responsibility on the water system for supplying safe water to the customers and controlling cross-connection hazards. This law prohibits the purveyor from installing or maintaining a water service connection to a customer where cross connections or backflow hazards exist or have potential to exist.

The City of Kingsport Board of Mayor and Alderman passed a City of Kingsport Ordinance 4296 in March of 1996 to protect the potable water supply from the possibility of contamination, due to a cross connection, by isolating real or potential sources of contamination or pollution that may backflow by way of back-siphonage or back-pressure into the public water supply system. The City of Kingsport Water Department is responsible for the enforcement of this ordinance and developed policy and procedures (WSPD12) to set guidelines to enforce, implement and maintain a Cross Connection Program.

Determination of Backflow Requirements

Backflow requirements vary depending on the degree of hazard. The City of Kingsport Water Department utilizes customer classification and type of service connection to establish a baseline for requirements that is followed by a survey to determine if a degree of hazard exists that would warrant an increase of requirements. **Do not install backflow prevention assembly(s) until notification of survey results has been received. The following is baseline requirements only.**

Customer Classification	Type of Service Connection.	Baseline Requirements					
		Type of Device				Location of Device	
		Dual Check	Reduced Pressure Principle Assembly	Reduced Pressure Detector Assembly	Double Check Detector Assembly	With-in 10 Ft. of tap to the City of Kingsport Water line on Customers' Property and meets installation criteria	On Customers' Property at the customers' desired location as long as there are no branches prior to the backflow and meets installation criteria
Industrial							
	Domestic		Required			**Required	
	Irrigation		Required			**Required	
	Fire- Class I and II (Chemical Free)				Required	**Required	
	Fire-Class I and II (containing Chemicals)			Required		**Required	
Commercial							
	Domestic		Required				Required
	Irrigation		Required				Required
	Fire- Class I and II (Chemical Free)				Required	**Required	
	Fire-Class I and II (containing Chemicals)			Required		**Required	
Residential							
	Domestic	*City Installed					
	Irrigation			Required			Required

*** The City of Kingsport Water Maintenance Department began to install water meter assemblies equipped with a dual check valve, in February 2004 on all new residential water service connections and as existing water service connections are warranted or scheduled for replacement.**

**** A variance can be requested if the slope, obstruction, etc. would prevent installation with-in required distance and/or the building is less than 60 ft. from the service connection.**

Note: The installation of a backflow prevention assembly, dual-check valve, swing check valve, or pressure reducing valve makes the plumbing system a “closed system”. **A closed system can create problems due to thermal expansion. Please read page 4 for information on thermal expansion and how to prevent damage to a water heater or plumbing fixtures.**

Surveying

Surveying is crucial in protecting the City of Kingsport potable water Supply. The city of Kingsport Water Quality Division performs two types of surveys. The first is an educational survey for customers with a low degree of hazard and the second is an on-site survey for customers with a moderate to high degree of hazard.

Educational Survey

Educational surveys are performed by using Backflow Prevention Requirements/Information packet, workshops, City of Kingsport Website, etc. The goal is to educate customers with a low degree of hazard on what a cross connection is, the associated health risks, prevention and how to perform a survey.

On-site Survey

The City of Kingsport Water Quality specialist will perform a on-site survey of the premises to locate cross connections while educating the customer on what a cross connection is, the associated health risks, prevention and how to perform a survey.

A survey of the premises by a Water Quality Specialist does not guarantee that all cross connections will be identified and/or will not be created. The owner/responsible person need to frequently survey or have the property surveyed.

If the City of Kingsport Water Quality Specialist fills that a hazard is present that warrants an increase of baseline requirement then a Degree of Hazard Change Form will be submitted to the Water Administrative Superintendent or Water Services Manager for approval prior to imposing a higher degree of requirements.

Surveying for Cross-Connections

Surveying is crucial in protecting the potable water system. Surveying for cross-connections is broken down into two categories customers requesting a service connection and customers that have an existing water service connection.

Request for Service Connection

Industrial and Commercial Customers applying for service connection and Residential customers requesting irrigation service connection

A City of Kingsport Water Quality Specialist will perform an on-site survey to determine if a degree of Hazard exists that would increase the baseline requirements. Please contact Ron Ison, Water Quality Specialist, or Charles Dykes, Water Quality Specialist, at (423) 229-9454 to schedule an on-site survey of the premises and/or plumbing plans.

Residential Customers applying for a domestic service connection

Residential Customers applying for a domestic service connection will be required to schedule an on-site survey that will be performed by a City of Kingsport Water Quality Specialist if one of the following hazards exists. Please **do not install** a backflow prevention assembly until after the survey has been performed. In many cases an air gap separation can be achieved and a backflow assembly is not required.

1. Auxiliary Water Supply

If an auxiliary water supply is present it will need to be disconnected from the plumbing system immediately and an Auxiliary Water Supply Agreement Form will need to be signed. This form states that the auxiliary water supply will be disconnected. If the customer chooses not to disconnect the auxiliary water supply then a backflow prevention assembly will be required. A City of Kingsport Water Quality Specialist will annually inspect to verify that the connection between the auxiliary water supply (well, etc.) and plumbing system has not been re-established.

2. Swimming Pool, Hot tub, etc.

An air gap separation (air gap) between what is being filled and what is being utilized to fill with has to be achieved or a backflow assembly device has to be installed.

3. Photo, chemical, medical or other labs facilities

Any in home use of photographic chemicals, other process chemicals or medical or biological laboratory supplies could cause contamination due to an unprotected cross connection. A backflow prevention assembly is required if an air gap separation can not be achieved.

Existing Water Service Connection

The city of Kingsport Water Quality Specialist will survey customers with existing water service connection as scheduled or warranted to determine if there is an unprotected cross connection.

Notification of Backflow Assembly(s) Required

Upon completion of the survey a Notification will be sent to the owner/responsible person depicting the backflow prevention assembly(s) required and location. The backflow prevention assembly(s) will need to be installed per installation requirements with-in sixty days of notification.

Failure to install the required backflow prevention assembly(s) per installation requirements with-in sixty days will result in the termination of water service connection(s).

Installation Requirements

1. Only persons certified by the State or the Tennessee Association of Utility Districts shall perform installation of a backflow prevention assembly. Evidence of current certification at the time of installation is required.
2. All backflow prevention assemblies shall be fully approved by the Foundation for Cross Connection Control and Hydraulic Research and listed as acceptable by the State. Please contact a City Kingsport Water Quality Specialist for a list of approved assemblies.
3. All backflow prevention assemblies shall be installed in a horizontal run of pipe. No vertical installation of backflow prevention devices shall be allowed unless the University of Southern California Foundation approves such device for such installation for Cross Connection Control and Hydraulic Research.

4. All backflow prevention assemblies shall be installed above ground, free from submergence or flood potential, gravity drainage, and meet confined space requirements of OSHA/TOSHA.
5. Clearance of backflow prevention assembly from wall surfaces or other obstructions shall be a minimum of 6” or if a person must enter the enclosure for repair or testing the minimum distance shall be 24”. The device must be accessible for testing and maintenance.
6. Reduced Pressure Principle Detector Assembly shall be positioned where discharge from a relief port is 12” plus the nominal diameter of the supply line above floor surface and a maximum of 48”.
7. Double check detector assembly shall be a minimum of 12” from floor surface and a maximum of 48”.
8. Backflow prevention assembly installed outside will need to be protected from freezing, vandalism, mechanical abuse, and from any corrosive, sticky, greasy, abrasive or other damage substance.
9. Backflow prevention assembly installed for Irrigation connection (seasonal) can be taken out during freezing weather and then re-installed. A Water Quality Specialist will need to be notified prior to the device being removed and prior to being re-installed.
10. Fire Hydrant drains shall not be connected to the sanitary sewer and Fire hydrants shall not be installed in such manner that back-siphonage or backflow through the drain could occur.

Maintenance and Testing of Backflow Prevention Devices

The City of Kingsport Water Quality Specialist will test the backflow prevention assembly(s) upon installation and then annually at no charge. This is to ensure the assembly has been installed properly, not altered and that it is in good working condition.

In the event the device(s) fail the test then a Notification of failure will be mailed to the owner/responsible person (attachment 6). The backflow prevention assembly(s) will need to be repaired at the Owners/responsible person expense.

The assembly(s) will need to be repaired by only persons certified by the State of Tennessee or the Tennessee Association of Utility Districts **with-in thirty days of notification**. After repairs have been made a City of Kingsport Water Quality Specialist will re-test the assembly(s).

The failure to repair and maintain the backflow prevention assembly(s) will result in the termination of Water Service.

Thermal Expansion

The installation of a backflow prevention assembly, dual-check valve, swing-check valve, or pressure reducing valve makes the plumbing system a “**closed**” system, and prevents the heated/expanded water from being forced back into the public water distribution system.

The water heater in your home/business goes through a “recovery process each time hot water is used. Normally, this process occurs several times daily, depending on how often hot water is demanded. As the hot water is used, it is replaced with cold water and the water heater begins to heat that water to the desired temperature setting on the water heater. This recovery cycle creates a condition known as **THERMAL EXPANSION** – as water is heated it expands. Since water is an incompressible liquid, it must expand by any means available. Water heaters are equipped with a temperature and pressure (T & P) relief valve, which is designed to relieve excessive temperature and pressure within the heater enclosure. This T & P

valve is an **emergency relief valve**, and is not intended to compensate pressure increases created by thermal expansion.

Prior to the installation of a residential double-check valve or a backflow prevention assembly, the public water distribution system had provided a “cushion” which absorbed the pressure build-up within the private plumbing system/water heater by allowing the heated and expanded water from the water heater to Flow back into the public water distribution system. By Federal and State definition, reverse movement or backflow from an unmonitored source and/or a private plumbing system into the public water distributions system is strictly prohibited.

Thermal Expansion can easily be contained by the use of a Thermal Expansion Relief Valve, Thermal Expansion Ball-Cock, or a Thermal Expansion Tank. These products are available from most plumbing supply stores. Some of the manufacturers producing these devices are Amtrol, Conbraco, Febco, Watts, and Wilkins.

Failure to address this problem within your private premises may cause serious damage to your water heater or plumbing fixtures. **The City of Kingsport Water Services Division is not responsible for any damage to private property caused by Thermal Expansion.**