# Cross-Connection Control Program

## LACONIA WATER DEPARTMENT

**988 UNION AVENUE, LACONIA NH 03247**
**603-524-0901**
**(last revised October 21st, 2020)**

## I. Purpose

Cross-Connections between water supplies and non-potable sources of contamination are significant threats to health in the water supply industry. This ordinance is designed to maintain the safety and potability of the water in the Laconia Water Department by establishing rules and procedures to prevent the contamination of public drinking water by the backflow of water from an approved source or other fluids.

**A.** The purpose of this regulation is:

1. To protect the public water supply of the Laconia Water Department from the possibility of contamination by isolating contaminants which could backflow or back-siphon into the public water system within its customers' internal distribution system(s);

2. To promote the elimination or control of cross-connections, actual or potential, between its customers' in-plant drinking water system(s) and anything that could contaminate or pollute it; and

3. To provide for the maintenance of a cross-connection control program to effectively prevent the contamination or pollution of all drinking water systems.

This document is intended to supplement the rules listed in section II below. Changes to this document in the future must be approved by the New Hampshire Department of Environmental Services (NHDES).

## II. Authority

**A.** New Hampshire Administrative Rule Env-Ws 364, or subsequent rules, *Backflow Prevention.*

**B.** Laconia Water Department Tariff Page 18, Article XXXII, and Article XXXIII.

## III. Requirements

The water superintendent shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollution through the water service connection. If, in the judgment of the water superintendent, an approved backflow prevention device is required at the City of Laconia's water service connection to any customer's premises for the safety of the water system, the water superintendent or his designated agent shall give notice, in writing, to said customer to install an approved backflow prevention device at

each service connection to his premises. If the Laconia Water Department determines at any time that a serious threat to the public health exists, the water service shall be terminated immediately. The customer shall, within 30 days, install approved device or devices at his own expense. Failure, refusal, or inability on the part of the customer to install said device or devices within 30 days shall constitute grounds for discontinuing water service to the premises until such device or devices have been properly installed.

## lV. Definitions

**A.** Auxiliary Water Supply – Any water supply on or available to the premises other than the purveyor's approved public potable water supply.

**B.** Backflow – The flow of water or other fluids, mixtures or substances into the distribution pipes of a potable water system from any source other than the intended approved source of supply.

**C.** Backflow Preventer – A device or means designed to prevent backflow or back-siphonage.

**1.** Air Gap – A physical separation sufficient to prevent backflow between the free-flowing discharge end of the potable water system and any other system. Physically defined as a vertical distance equal to twice the diameter of the supply pipe but not less than one inch.

**2.** Atmospheric Vacuum Breaker – A device which prevents back-siphonage by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a water system. This device is not approved per the department.

**3.** Barometric Loop – A fabricated piping arrangement rising at least 35 feet at its topmost point above the highest fixture it supplies. It is utilized in water systems to protect against back-siphonage. This device is not approved per the department.

**4.** Double Check Valve Assembly – An assembly of two independently operating spring loaded check valves with tightly closing shut-off valves on each side of the double check valve, plus properly located test cocks for the testing of each check valve.

**5.** Dual Check Valve with Intermediate Atmospheric Vent – A device having two independently operating spring loaded check valves separated by an atmospheric vent chamber.

**6.** Hose Bib Vacuum Breaker – A device which is connected to a hose bib and which acts as an atmospheric vacuum breaker. Not to be used under constant pressure. This device is not approved per the department.

**7.** Pressure Vacuum Breaker – A device containing one or two independently operated spring loaded check valves and an independently operated spring loaded air inlet valve located on the discharge side of the check valve(s). The device includes tightly

closing shut-off valves on each side of the check valve(s) and properly located test cocks for the testing of the assembly. This device is not approved per the department.

**8.** Reduced Pressure Principle Backflow Preventer – An assembly consisting of two independently operating spring loaded check valves with an automatically operating differential relief valve located between the two check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.

**9.** Residential Dual Check – An assembly of two spring loaded independently operating check valves. Generally employed immediately downstream of the water meter to act as a containment device in a single or two family residence.

**D.** Backpressure – A condition in which the owner's system pressure is greater than the supplier's system pressure.

**E.** Back-Siphonage – The flow of water or other fluids, mixtures or substances into the distribution pipes of a potable water system from any source other than its intended source caused by the sudden reduction of pressure in the public water system.

**F.** Containment – A method of backflow prevention which requires a backflow prevention device at the water service entrance.

**G.** Contaminant – A substance that may impair the quality of the water creating a potential health hazard to the public.

**H.** Cross-Connection – Any actual or potential connection between the public water system and any source of contamination or unapproved water source.

**I.** Fixture Isolation – A method of backflow prevention in which a backflow preventer, such as a hose bib or an atmospheric vacuum breaker, is located to correct a cross-connection at an in-plant location rather than at a water service entrance. This protects the drinking water in the building.

**J.** Owner – Any person who has legal title to, or license to operate or habitat in, a property upon which a cross-connection inspection is to be made or upon which a cross-connection may be present.

**K.** Person – Any individual, partnership, company, public or private corporation, political subdivision or agency of the state, department, agency or instrumentality of the United States, or any other legal entity.

**L.** Premise Isolation – A method of backflow prevention into a public water system from a user's premises by installing a suitable backflow prevention device on the customer's water service lateral.

**M.** Water Service Entrance – That point in the owner's water system beyond the sanitary control of the water supplier; generally considered to be the outlet end of the water meter or where the water service first enters the building.

**N.** Water Superintendent – The official, or his delegated representative, in charge of Laconia Water Department who is invested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this ordinance.

**O.** Water Supplier – The public water supply system.

**P.** Laconia Water Department – The water supplier for the city of Laconia here in reference to as the department.

## V. Administration

**A.** The Department will operate an approved cross-connection control ordinance, including the keeping of necessary records to fulfill the requirements of NHDES's Backflow Rules, Regulations, and related laws.

**B.** The owner shall allow the Department to inspect his property for possible cross-connections and shall follow the provisions of the Department's ordinance and their rules.

**C.** If the Department requires that the public supply be protected by containment, the owner shall be responsible for the water quality beyond the outlet end of the containment device and should utilize the appropriate device approved for that purpose.

## VI. Responsibilities

### A. Laconia Water Department

**1.** On new installations, the Department will provide an on-site evaluation and/or inspection and review of plans in order to determine the type of backflow preventer, if any, that will be required.

**2**. On new installations, the Department will issue a permit and perform inspection and testing.

**3.** For premises existing prior to the start of this program, the Department will:

**a.** Perform an assessment of the function of the premise and determine if it poses a cross-connection risk. If a risk is present, asses the risk as high hazard or low hazard.

**b.** Inform the owner in writing of any corrective action deemed necessary, the method of achieving the correction, and the time allowed for the correction to be

made. Ordinarily, 30 days will be allowed. However, this time period may be shortened depending upon the degree of hazard involved and the history of the device(s) in question.

**4.** The Department will not allow any cross-connection to remain unless it is isolated by an approved backflow prevention assembly, commensurate with the degree of hazard, for which a permit has been issued and which will be regularly inspected/tested to ensure satisfactory operation.

**5.** The Department shall inform the owner in writing of any failure to comply and the time allowed for the correction to be made. If upon re-inspection the owner has not complied, the Department may allow an additional 15 days for the correction. In the event the owner fails to comply with the necessary correction by the time of the second re-inspection, the Department will inform the owner by posting the premises. In the event that the owner informs the Department of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the Department.

**6.** If the Department determines at any time that a serious threat to the public health exists, the water service shall be terminated immediately.

**7.** The Department shall begin inspections to determine the nature of existing hazards and corrections to be made, following approval of the program by NHDES. Initial focus will be on high hazard water use.

**8.** Certified backflow prevention device inspectors must be certified through the NEWWA Certified Backflow Prevention Device Inspectors/Testers Program.

**B. Owner**

**1.** The owner shall be responsible for the elimination or isolation with the proper installation of an approved backflow preventer commensurate with the degree of hazard, for all cross-connections on his premises.

**2.** The owner, after having been informed by a letter from the Department, shall, at their expense, install, maintain, and inspect all backflow preventers on their premises.

**3**. The owner shall correct any deficiency of a backflow preventer which is revealed by inspection or testing. This shall include the replacement of parts or the replacement of the backflow preventer, if deemed necessary by the Department.

**4.** The owner shall inform the Department of any proposed or modified cross-connections and also existing cross-connections of which the owner is aware but has not been found by the Department.

5. The owner shall not install a by-pass around any backflow preventer unless there is a backflow preventer of the same type on the by-pass. Owners who cannot shut down operations for inspecting of the device(s) must supply additional devices necessary to allow inspecting to take place.

6. The owner shall install backflow preventers in a manner and location approved by the Department. See page 12 for more details.

7. The owner shall only install approved backflow preventers from a list provided by DES. Please see the following website for more information; http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-11-1.pdf

8. Any owner having a private well or other private water source must:

   a. Have a permit if the well or source is cross-connected to the Department's system. Permission to cross-connect may be denied by the Department. The owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the Department's system.

   b. In the event the owner installs plumbing to provide drinking water for domestic purposes which is on the Department's side of the backflow preventer, such plumbing must have its own backflow preventer installed.

9. The owner shall be responsible for the payment of all fees for permits, annual or semi-annual device inspections, re-testing in the case that the device fails to operate correctly, and re-inspections for non-compliance with the Department or NHDES requirements.

10. If the owner fails to make payments for the fees according to the previously mentioned tasks, then the Department will terminate the water service to the property prior to the next scheduled visit.

## VII. Degree of Hazard

The Department recognizes the threat to the public water system arising from cross-connections. All threats will be classified by degree of hazard and will require the installation of approved backflow prevention devices for high and low hazards.

### A. Low Degree of Hazard

If backflow were to occur, the resulting effect on the water supply would be a change in its aesthetic qualities. The foreign substance must be non-toxic to human.

**B. High Degree of Hazard**

If backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans from either a chemical, bacteriological or radiological standpoint. The effects of the contaminants may result from short or long term exposure.

Only the following types of backflow prevention devices may be used for the containment of on-site contaminants for high and low hazard situations respectively:

**C. High Hazard:**

**1.** Air gap (AG)

**2.** Reduced pressure principal backflow preventer (RPZ)

**3.** Combination of the above

**D. Low Hazard:**

**1.** Air gap (AG)

**2.** Double check valve assembly (DCVA)

**3.** Reduced pressure principal backflow preventer (RPZ)

**4.** Combination of the above

## VIII. Premises Isolation

There are two levels of protection shall be recognized for premises isolation as follows:

**A.** Premises with low hazard classification shall be isolated with a DCVA backflow prevention device. The following are examples of buildings or facilities that shall be isolated from the water supply by a DCVA backflow prevention device:

| | |
|---|---|
| • Shopping Malls | • Multi-service interconnected facilities |
| • Apartments | • Boat marinas (non mechanical service providers) |
| • Office Buildings | • Multi-tenant single service facilities |
| • Schools and Colleges | • Premises with sprinkler systems (non glycol loops) |

**B.** Premises with high hazard classification shall be isolated with a RPZ backflow prevention device. The following are examples buildings or facilities that shall be isolated from the water supply by a RPZ backflow prevention device:

| | |
|---|---|
| • Hospitals, laboratory | • Hair Salons |
| • Mortuary facilities | • Landscaping irrigation systems |
| • Commercial Laundries | • Restaurants |
| • Chemical or plating plants | • Premises with sprinkler systems (glycol loop) |

*NOTE: The above listings are examples only. The Water Superintendent will eventually determine the appropriate backflow prevention device for the specific application.*

## IX. Permits

The Department shall not permit a cross-connection within the public water system unless it is considered necessary and cannot be eliminated.

**A.** Cross-connection permits that are required for each backflow prevention device are obtained from the Department. A $10.00 dollar fee will be charged for each permit.

**B.** Cross-connection permits shall be renewed every five years and are non-transferable. Permits are subject to revocation and become immediately revoked if the owner should so change the type of cross-connection or degree of hazard associated with the service type of device, replacement of device with a new device, or change of ownership

**C.** A permit is not required when fixture isolation is achieved with the utilization of a non-testable backflow preventer in the case of residential dual checks.

## X. Existing in-use Backflow Devices

Any existing backflow preventer shall be allowed by the Department to continue in service unless the degree of hazard is such as to supercede the effectiveness of the present backflow preventer, or unless an unreasonable risk to the public health results. Any existing backflow preventers will need to be inspected and tested by the Department prior to being accepted.

## XI. Periodic Testing

**A.** Backflow prevention devices shall be inspected and tested at least annually.

**B.** Testing will be performed by an inspector from the Department certified through the NEWWA Backflow Prevention Device Inspectors/Testers Program, The inspections shall

be conducted during the Department's regular business hours. Exceptions to this, when at the request of the owner and approved by the department, may require additional charges to cover the increased costs to the Department.

**C.** Any backflow preventer which fails the inspection test during a periodic inspection will be repaired or replaced. When repairs are necessary, upon completion of the repair the device will be inspected a second time at the owner's expense to ensure correct operation. High hazard situations will not be allowed to continue unprotected, if the backflow preventer fails the inspection and cannot be repaired immediately. In other situations, a compliance date of not more than 30 days after the inspection date will be established. The owner is responsible for spare parts, repair tools, and/or a replacement device. Parallel installation of two devices is an effective means of the owner ensuring that uninterrupted water service is provided during inspections or repair of devices and is strongly recommended when the owner desires such continuity.

**D.** These devices shall be repaired or replaced at the expense of the owner whenever said devices are found to be defective. Tests and repairs shall be recorded on forms approved by the water superintendent, and copies shall be distributed to the owner per request.

**E.** Backflow prevention devices may be inspected more frequently than specified in section A above; in cases where there is a history of test failures and the Department feels that due to the degree of hazard involved, additional inspections are warranted. Cost of the additional inspections will be borne by the owner.

## XII. Records and Reports

**A.** **Records** – The Department will initiate and maintain the following for a minimum of five years:

**1.** Master files on customer cross-connection inspections and/or tests.

**2.** Master files on cross-connection permits.

**3.** Copies of permits and permit applications.

**B.** **Reports** – Each year, by April 1, the Department will submit a summary of inspection results to NHDES that includes the following:

**1.** The name, certifying organization, and certification number of the certified backflow prevention device inspector who performed the inspection and test on the device;

**2.** The permit number;

**3.** The name of the owner and the location of the device;

**4.** The purpose of the device and its hazard class;

5. The type of device;

6. The date and result of each test; and

7. If the test failed, the subsequent test date and result until the device passes.

**EXAMPLE SUMMARY REPORT:**

Laconia Water Department
Certification #: 1234
Inspector Name: Jon Doe

| Permit # | Owner | Location | Purpose | Hazard | Type | 1st Test | Pass | Fail | Subsequent Test Dates (P/F) |
|---|---|---|---|---|---|---|---|---|---|
| LW1001000 | School House | 12 School Street | Sprinkler | High | PRZ | 6/10/2010 | X | | |
| LW1001001 | Best Restaurant | 34 Sugar Hill | Fire Service | Low | DC | 5/28/2010 | X | | |
| LW1001002 | Cool Condos | 789 Green Street | Irrigation | Low | RPZ | 6/5/2010 | | X | **7/1/2010 (F); 7/15/2010 (P)** |
| LW1001003 | Shipping Store | 56 Main Street | Domestic | Low | RPZ | 6/1/2010 | X | | |

## XIII. Fees and Charges

The Department will publish a list of fees or charges for the following:

### A. Fees

1. Fees for testing- $40.00

2. Fees for re-testing- $40.00

3. Fees for multiple test done the same day- $30.00 for two or three per test
   and same location $20.00 for four or more per test

4. Fees for Backflow Preventer permits and renewal of permits- $10.00

## XIV. Residential Dual Check

**A.** Effective the date of acceptance of this Cross-Connection Control Ordinance for the City of Laconia, all new or substantial upgrade where a building permit is necessary, it will be required to install a residential dual check valve device immediately downstream of the water meter. Installation of this residential dual check valve device on a retrofit basis on existing service lines will be instituted at a time and at a potential cost to the homeowner as deemed necessary by the Department.

**B.** The owner should be aware that installation of a residential dual check valve results in a closed plumbing system with the residence. As such, provisions may have to be made by the owner to provide for thermal expansion within the closed loop system, i.e., the installation of thermal expansion tanks and/or pressure relief valves.

## XV. Multi-Unit Residential Buildings

**A.** Effective the date of acceptance of this Cross-Connection Control Ordinance for the City of Laconia, any and all multi-unit residential units with four or more units will be required to have a backflow prevention device installed at the point where the water service enters the structure.

**B.** Any multi-unit residential buildings with less than four units see section XIV Residential Dual Check for the proper device and installation.

## XVI. Strainers

**A.** The Department strongly recommends that all new retrofit installations of reduced pressure principle devices and double check valve backflow preventers include the installation of strainers located immediately upstream of the device to prevent fouling of backflow devices due to unforeseen circumstances occurring to the water system such as water main repairs, water main breaks, fires, periodic cleaning and flushing of mains, etc. These occurrences may ‘stir up’ debris within the water main that will cause fouling of backflow devices installed without the benefit of strainers.

**B.** No strainer is to be used in a fire line without the approval of the Insurance Underwriters or the authority having jurisdiction.

## XVII. Installation

**A.** GENERAL--Devices must be installed in a manner consistent with manufacture’s installation instructions, as well as all State of New Hampshire and City of Laconia plumbing codes. This includes installation and support, as well as maintenance and repair of devices. Once the device is installed it is the responsibility of the owner to notify the

Department of the installation. Only certified persons representing the Department may perform tests on Backflow Preventers.

**B.** Only devices approved by the State of New Hampshire may be installed.

1. A list of approved devices may be obtained from DES.

2. **No Vacuum Breakers are allowed per the Department.**

**C.** Devices must be installed:

1. In a manner consistent with the instructions of the device.

2. To allow for proper drainage if it is a Reduced Pressure Principal Device. A drain line dedicated to this device with the proper air gap is recommended by the Department.

   a. All RPZ devices must have a minimum of 12 inches of clearance from the bottom of the relieve port to the floor or ground. (See LWD sketch for more details)

   b. If a drain is installed, there must be an air gap between the device and the drain line.

   c. All assemblies shall be installed with a centerline height from 30 inches to 60 inches above the floor.

   d. A minimum of 12 inches clear space shall be maintained above the assembly to allow for servicing check valves and for operation of shut-off valves.

   e. A minimum of 24 inches of clear space shall be maintained between the front of the device and the nearest wall or obstruction.

   f. A minimum of 8 inches clearance should be maintained from the back of the device to the nearest wall or obstruction. This clearance may need to be increased for models that have side mounted test cocks or relief valves that would be facing the back wall.

   g. There are no pits allowed per the Department unless approved by the superintendent.

3. All devices will have valves on both the inlet side and the outlet side of the device.

4. The devices should be located on a proper and readily accessible location for all purposes including testing and removal. The device may change location at the request of the customer, only at his expense, and provided such change has been duly authorized by the Department.

**D.** Fire Services

1. All fire protection systems with no chemicals introduced to the system shall be protected by the following testable devices:

    a. Double check valve backflow prevention device.

    b. Reduced pressure principle backflow prevention device.

2. Where antifreeze, corrosion inhibitors, or other chemicals are added to a fire protection system supplied from a potable water supply, the water system shall be protected by the following device:

    a. Reduced pressure principle backflow prevention device.

**E.** Location of Devices

1. The device must be located at the service entrance before any feeder lines.

2. The device must be placed on the discharge side of the water meter unless otherwise approved by the Department.

**XVIII. Installation Diagrams (Attached)**

**A.** Residential Dual Check – No irrigation

**B.** Residential Dual Check – Irrigation line prior to domestic meter

**C.** Commercial – Low Hazard – No irrigation

**D.** Commercial – Low Hazard – Irrigation line prior to domestic meter

**E.** Commercial – High Hazard – No irrigation

**F.** Commercial -High Hazard – Irrigation line prior to domestic meter

Laconia Water Department
Joseph Driscoll III, Chairman

Witness

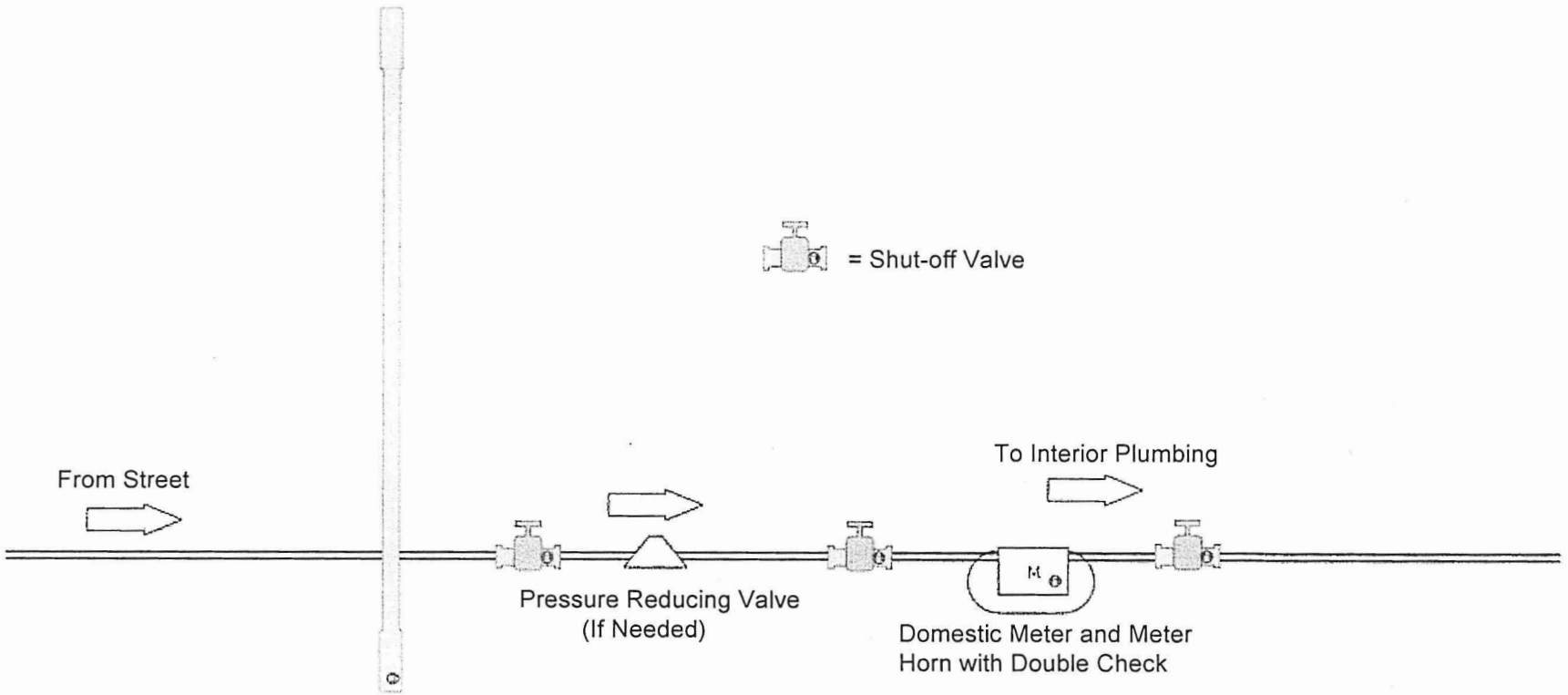
Date 1/14/21

Laconia Water Department
Benjamin D. Crawford, Superintendent

Witness

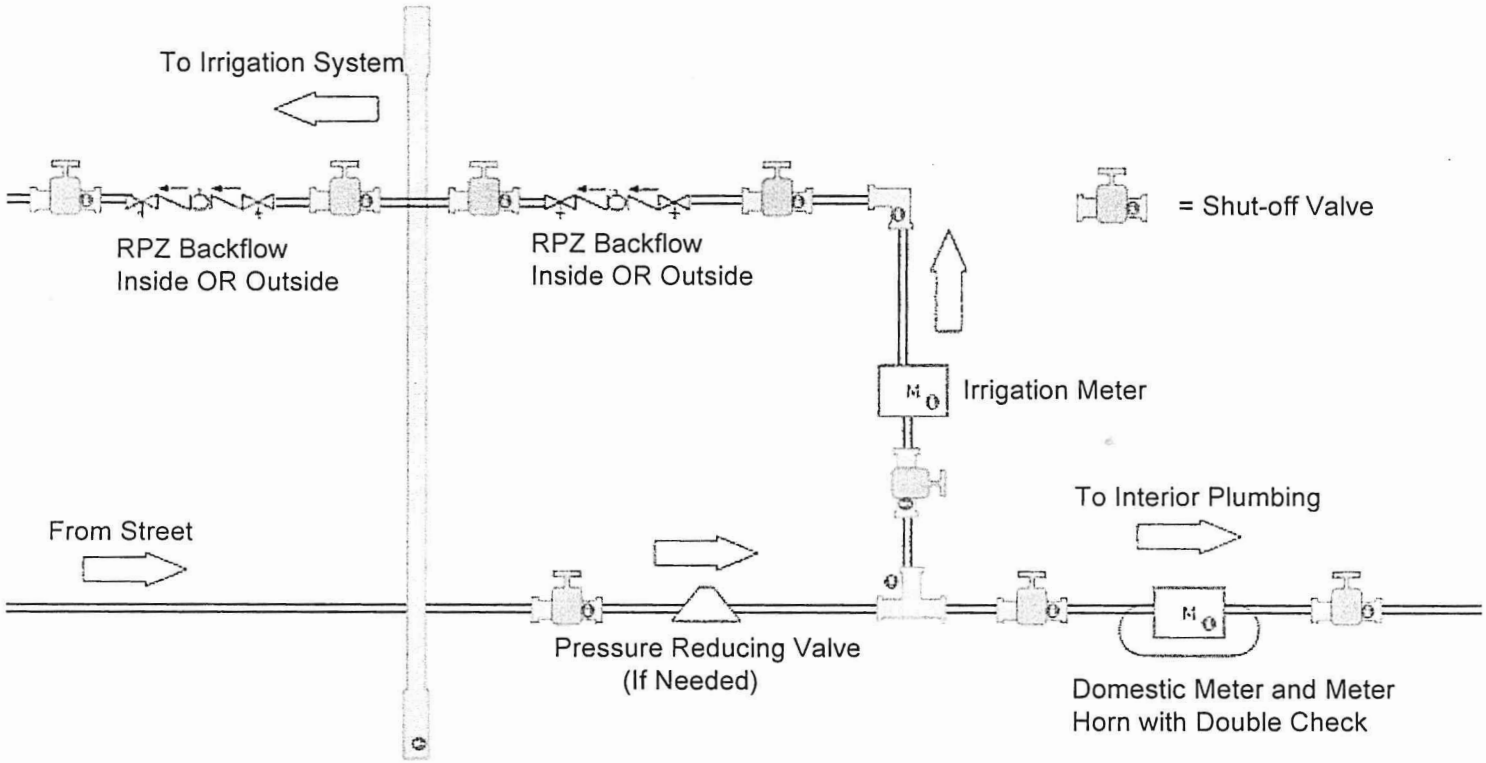
Date 1-14-21

# A. Residential Dual Check - No Irrigation




1. All Backflow devices to be installed according to manufacturer's specifications.
2. List of approved backflows can be found through the University of Southern California's Foundation for Cross-Connection Control and Hydraulic Research at https://fccchr.usc.edu/list.html
3. Meters and meter horns to be purchased from Laconia Water, or if supplied by others they must be approved by Laconia Water prior to installation.
4. No connections are to be made prior to backflow devices, unless approved by Laconia Water.

# B. Residential Dual Check - Irrigation Line Prior to Domestic Meter

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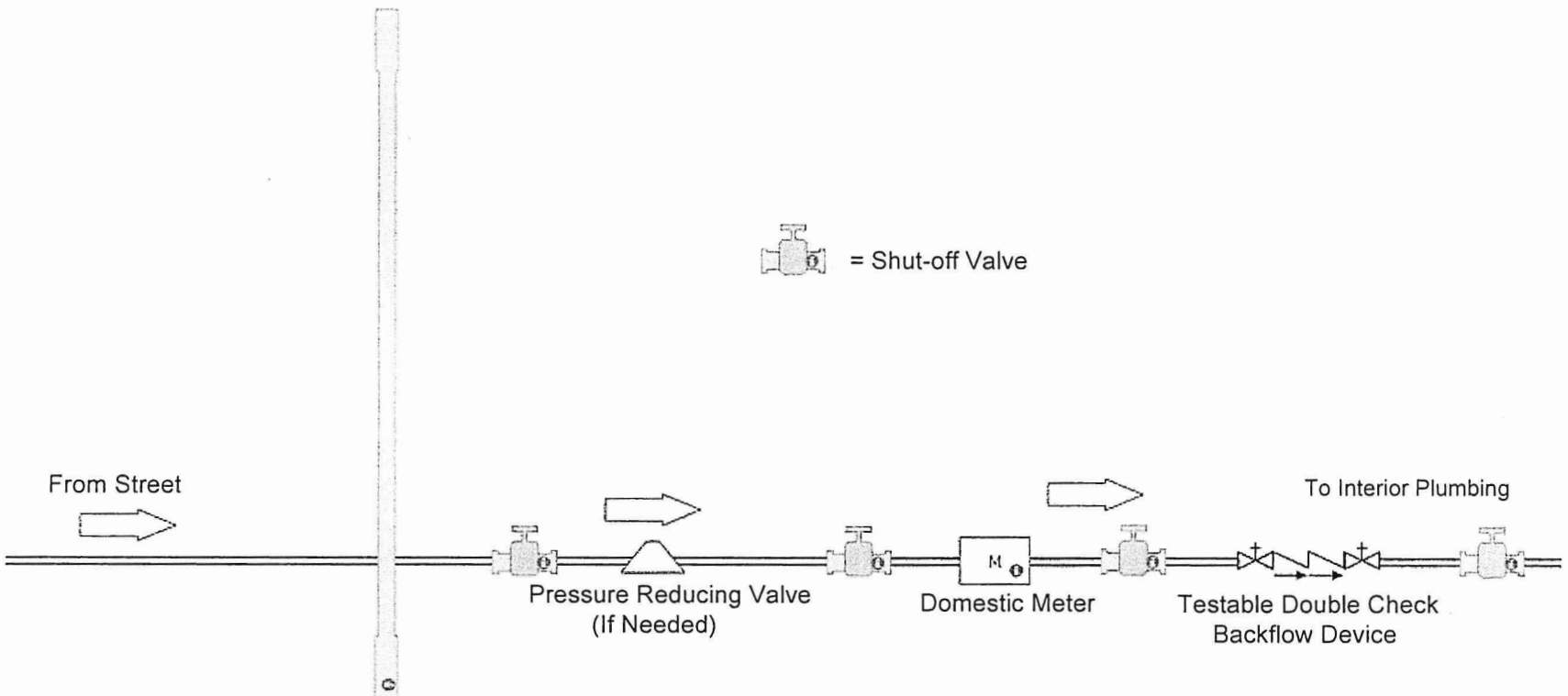
# C. Commercial - Low Hazard - No Irrigation

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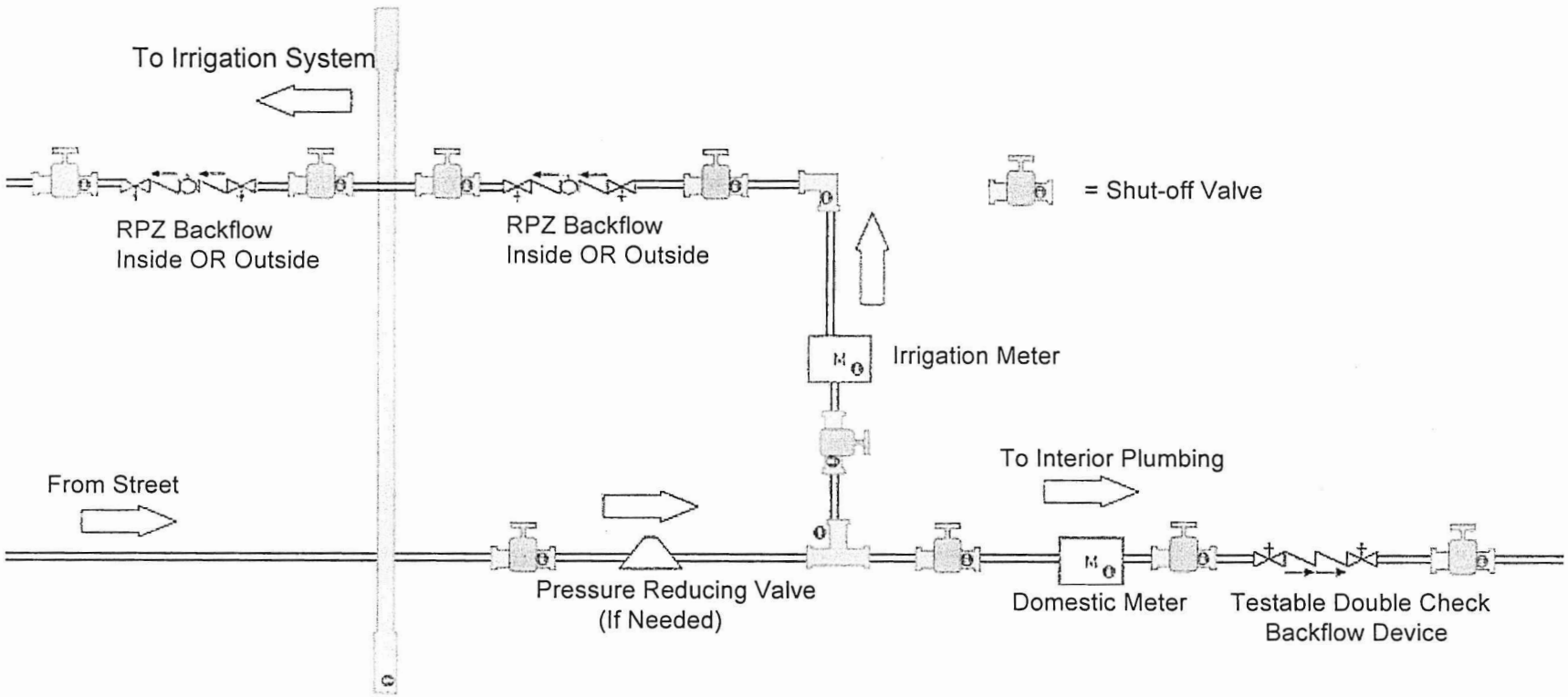


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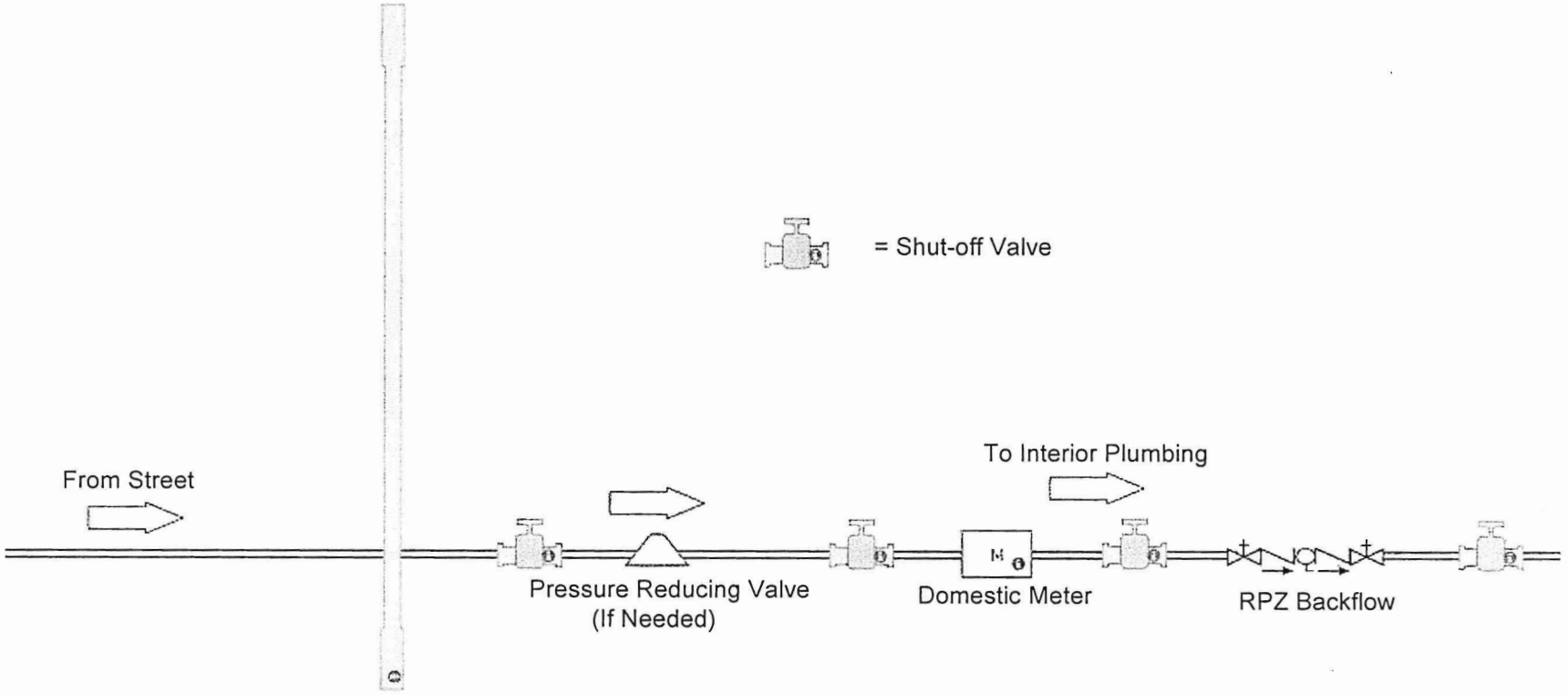
# E. Commercial - High Hazard - No Irrigation

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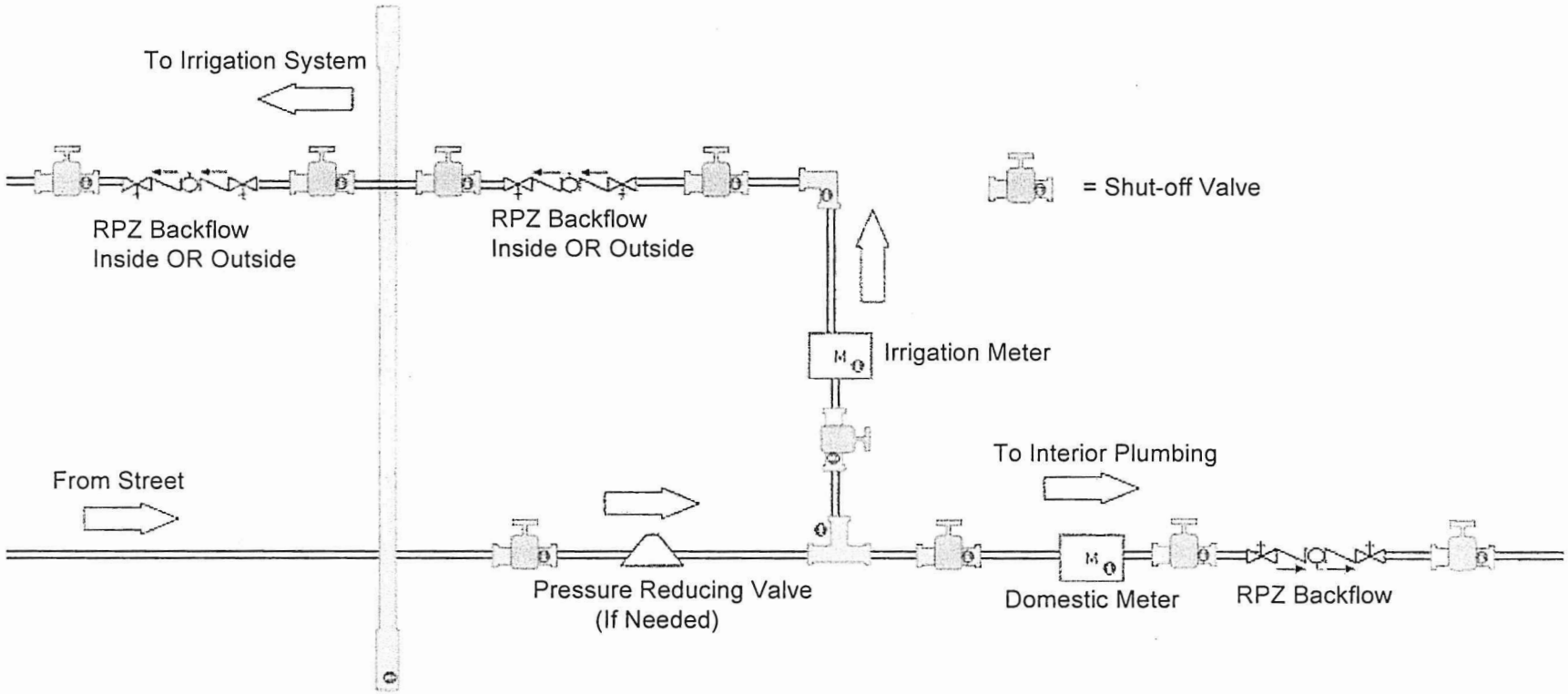


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