

Backflow Preventer Guidelines for Installation, Inspection and Testing

The District is required, by California Code of Regulations Title 17, Sections 7583-7605 of the Safe Drinking Water Act and California health and Safety Code, Sections 116800-116820, to evaluate potential hazards and take appropriate measures to protect the public potable water supply. The following are guidelines for backflow prevention device installation and maintenance. Device type is identified by District staff and communicated to customers during the permit process and during Cross-Connection Control Surveys.

Backflow Prevention Assemblies

There are five types of backflow preventers that are allowed to be used to protect a potable water supply:

- Air Gap
- Reduced Pressure Principle (RP)
- Pressure Vacuum Breaker (PVB)
- Double Check Valve Assembly
- Atmospheric Vacuum Breaker (AVBs in the District are approved only to protect backflow through a hose bib and are non-testable devices)

* All except the double check valve are allowable on irrigation systems

Air Gap Receiving Tank with Pump or Gravity Distribution

A receiving tank shall be installed on the property side of and adjacent to the water meter. The supply line between the meter and the tank must be permanently exposed for inspection purposes. There must be no outlet, tee, tap or connection of any kind to or from the supply pipe between the water meter and the opening from which the water is discharged into the receiving tank. The discharge inlet into the tank must be located at a distance of not less than two times the cross-sectional diameter of the inlet pipe above the top or overflow rim of the tank. Where required, a wind guard should be installed to prevent water loss or damage by wind-driven spray. The tank should be elevated (50 feet or more is recommended) to give an adequate gravity head; or, as an alternate, a pump may be installed to provide adequate head. *(See Exhibit B for proper installations)*

Mechanical Backflow Prevention Assemblies

An approved mechanical backflow prevention assembly shall be installed on the property side of and adjacent to the water meter or shall be installed adjacent to the specified point of use and in accordance with assembly installation guidelines *(see Exhibit C)*. Where construction or equipment location present citing problems for the above noted assembly a deviation may be granted by District staff, providing such request is made in writing prior to the installation of the assembly. On the service line there must be no outlet, tee, tap or connection of any sort to or from the supply pipe line between the water meter and the protective assembly.

Annual Testing and Inspection Requirements

All Mechanical Backflow Devices require inspections and testing at the time of installation, this will be performed by District staff. After a backflow device has passed its initial inspection and test, the device will be entered into the District's Backflow Testing program. Annually, as required by law, the owner will be required to provide proof of successful testing by a District approved certified tester.

Reduced Pressure Principle (RP)

This device is used in certain applications as determined by the District following California Code of Regulations Title 17, Sections 7583-7605 of the Safe Drinking Water Act and California health and Safety Code, Sections 116800-116820. It is also used in irrigation systems where elevation changes prohibit the use of using a PVB.

Installation Requirements:

- Must be a minimum clearance of 12" above grade and maximum of 36" above grade
- Must have side clearances of at least 12" from side walls
- Adequate clearance for repair and testing of valves
- Must drain to atmosphere with an adequate drain line (*See Exhibit A on RP dumping capacities*)
- Must have freeze protection
- Must be tested annually

Optional

- Wye strainer
- Pressure Regulator

Some systems may require strainers to protect the valves and the backflow device from grit and debris entering the system. The wye strainer is the device which provides this protection. If installed, the strainer outlet drain shall have no connections which would allow the connection of hoses. The connection may only be used to drain the strainer and blow the system out.

If the line pressure exceeds the maximum working pressure of the backflow device placement of pressure regulator will be required upstream of the backflow device.

(See Exhibit C for proper installations)

Double Check Valve Assembly Installation Requirements

Double check valves are only allowed to be installed in certain situations which are determined by the District following guidelines of Title 17 of the Safe Drinking Water Act. A double check valve assembly is never allowed to serve an irrigation system.

Installation Requirements:

- Must have a minimum clearance of 12" above grade and a maximum of 36" above grade
- Adequate clearance for repair and testing of valves
- Must have freeze protection
- Must be tested at least once annually
- Pressure requirements must be met for a double check valve assembly

If the line pressure exceeds the maximum working pressure of the backflow device placement of pressure regulator will be required upstream of the backflow device.

(See Exhibit C for proper installation)

Pressure Vacuum Breaker (PVB) or Spill-resistant Pressure Vacuum Breaker

These valves are typically used in the installation of irrigation systems. The system must be properly designed to maintain the integrity of the device.

Installation Requirements:

- Must be designed and installed to be located 12" above the highest point of downstream use
- Adequate clearance for repair and testing of valves
- Must have freeze protection
- Must be tested at least once annually
- System design must have absolutely no backpressure

If the line pressure exceeds the maximum working pressure of the backflow device placement of pressure regulator will be required upstream of the backflow device.

(See Exhibit C for proper installation and Exhibit D for PVB specific requirements)

All Backflow Assembly Installations:

- All backflow devices shall be listed on the approval list provided by the State of California and USC Foundation for Cross Connection Control and Hydraulic Research
- All installations shall provide for drainage to atmosphere
- All installations shall provide for adequate clearance for repair, maintenance and testing as outlined above
- All backflow devices shall be provided freeze protection
- All backflow devices shall be tested annually
- All installations must be inspected and approved by the District
- If the line pressure exceeds the maximum working pressure of the backflow device placement of pressure regulator will be required upstream of the backflow device

Backflow Prevention Assemblies are to be used within their rated operating specifications

Pressure: Backflow prevention assemblies typically have a maximum working water pressure (MWWP) of 150psi (1034KPa) or 175psi (1206 KPa). Assemblies are designed to operate continuously at this pressure, which is identified on the assembly.

Temperature: Backflow Prevention Assemblies are designed to operate continuously at their maximum working water temperature (MWT), which is identified on the assembly.

Rate of Flow: Backflow prevention assemblies are designed to operate continuously up to their rated GPM flow

NOTE: All installations of backflow prevention assemblies must be in compliance with state and local plumbing and building codes. Contact local administrative authority for detailed requirements.

No stop and waste valves can be installed prior to the backflow device

For Questions and Inspections Contact:

**Mammoth Community Water District
Regulatory Services Division
Cecil Bundesen @ 934-2596 Ext: 232
cbundesen@mcwd.ds.tca.us**

Note: Please schedule inspections with 48 hour advanced notice

Exhibit A**RP Dumping Capacities**

IPS	Discharge @ 60psi	Discharge @ 150psi
¾" - 1¼"	75gpm	140gpm
1½" - 2"	170gpm	280gpm
2½" - 3"	250gpm	400gpm
4" - 6"	500gpm	850gpm
8" - 10"	525gpm	890gpm

RP Drain Requirements

RP IPS	Drain Size @ 60psi	Excessive Pressure @ 150psi
¾" - 1¼"	3"	5"
1½" - 2"	6"	8"
2½" - 3"	6"	8"
4" - 6"	8"	10"
8" - 10"	8"	10"

Typical Flow Rates as Sized by Floor Drain

Size	GPM
2"	55
3"	112
4"	170
5"	350
6"	450
7"	760

Exhibit B Air Gap Installation Guidelines

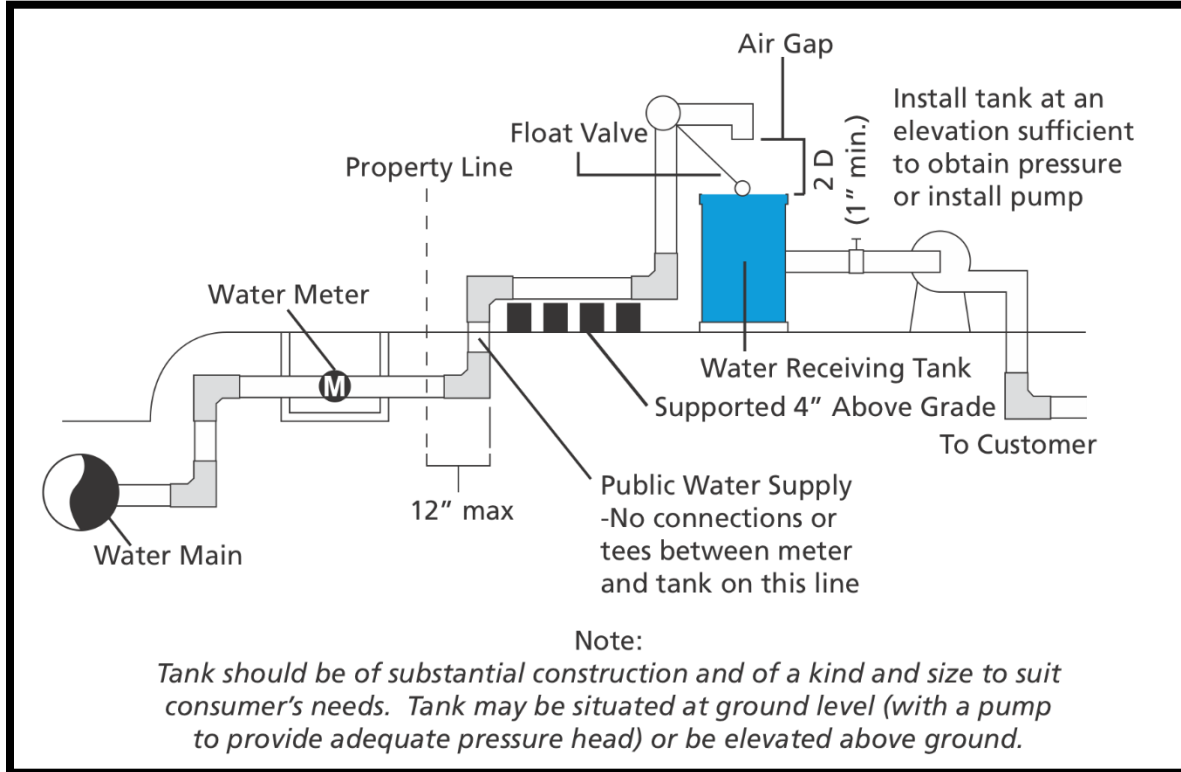
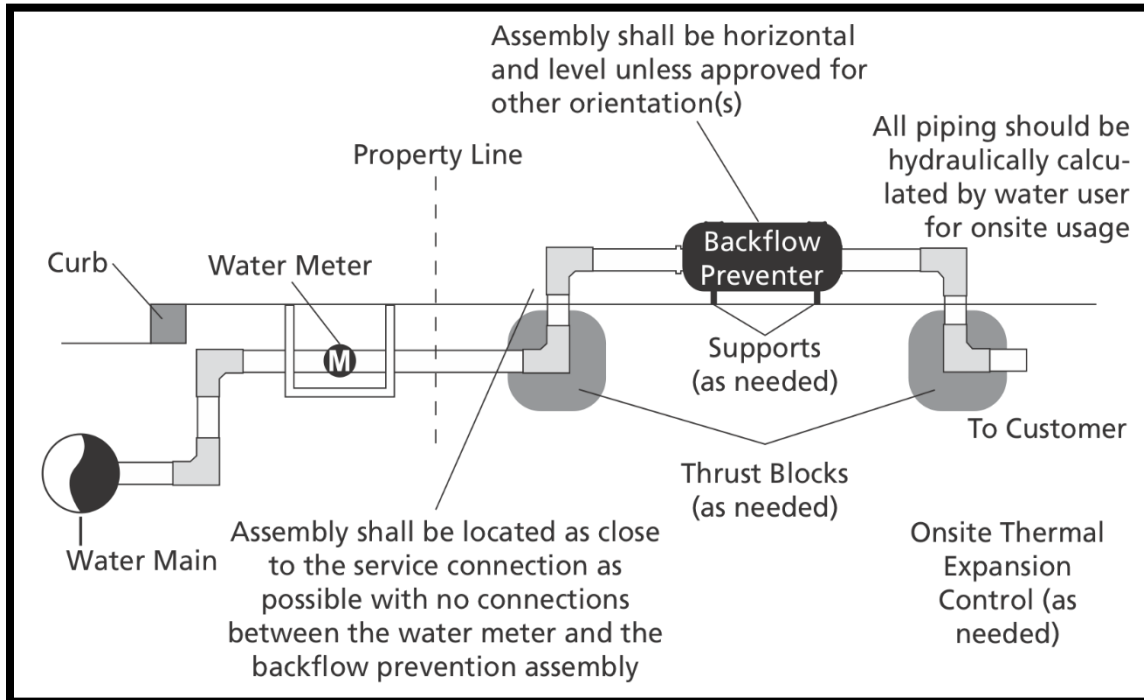


Exhibit C Mechanical Backflow Assembly Installation Guidelines

Service Connection Installation Guidelines



Internal Connection Installation Guidelines (Drain only required for RP installations)

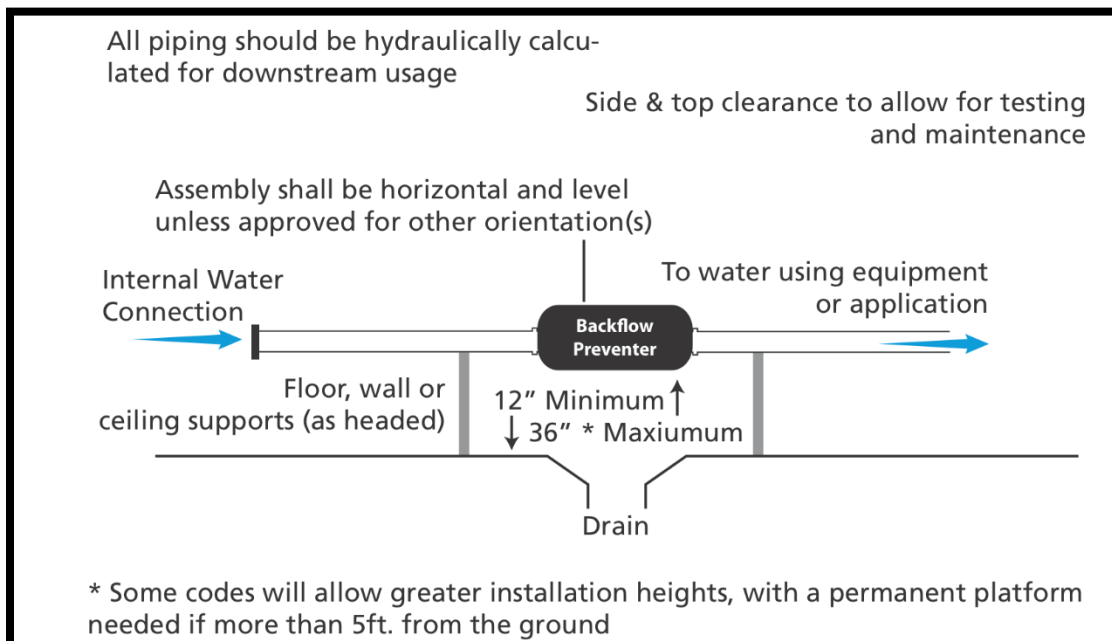
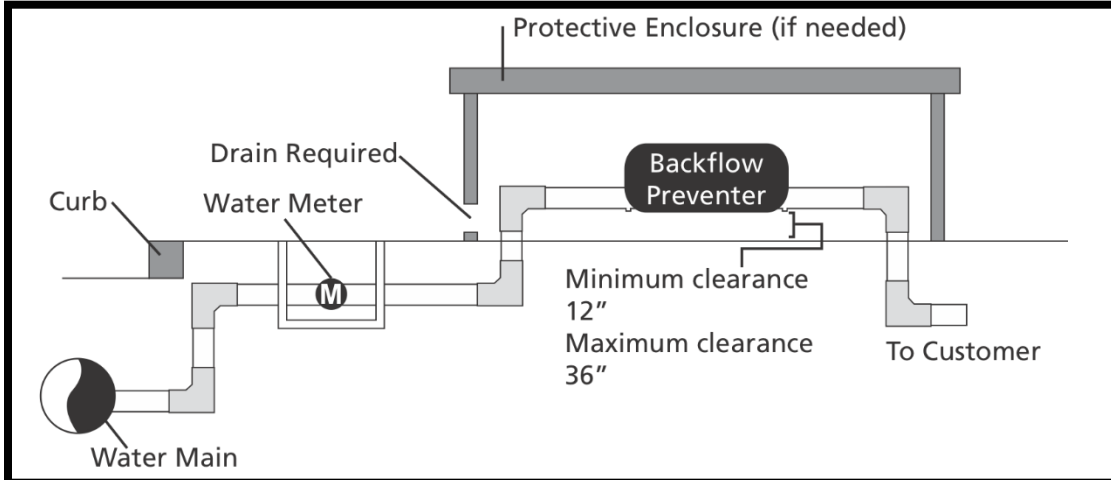
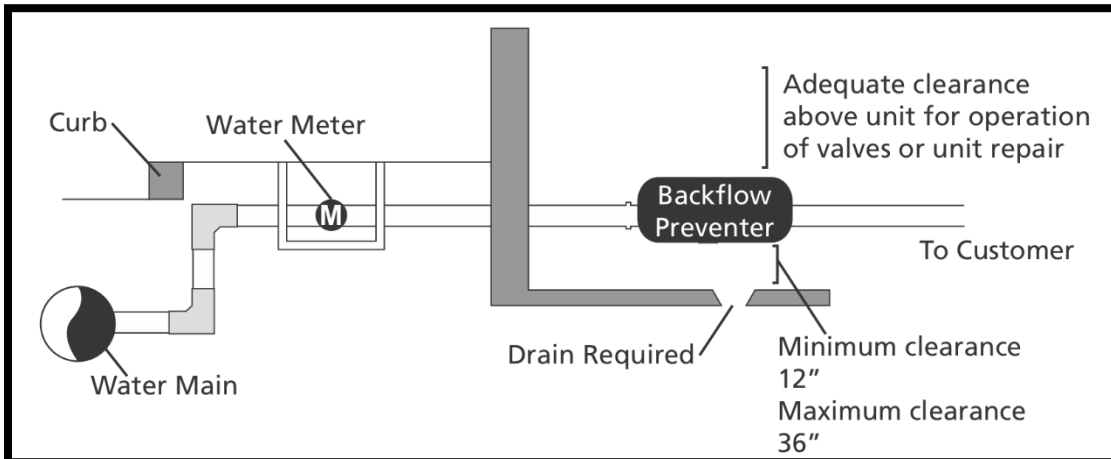


Exhibit C Continued Mechanical Backflow Assembly Installation Guidelines

Above Ground Guidelines



In Building Guidelines (Drain only required for RP installations)



In Basement Guidelines (Drain only required for RP installations)

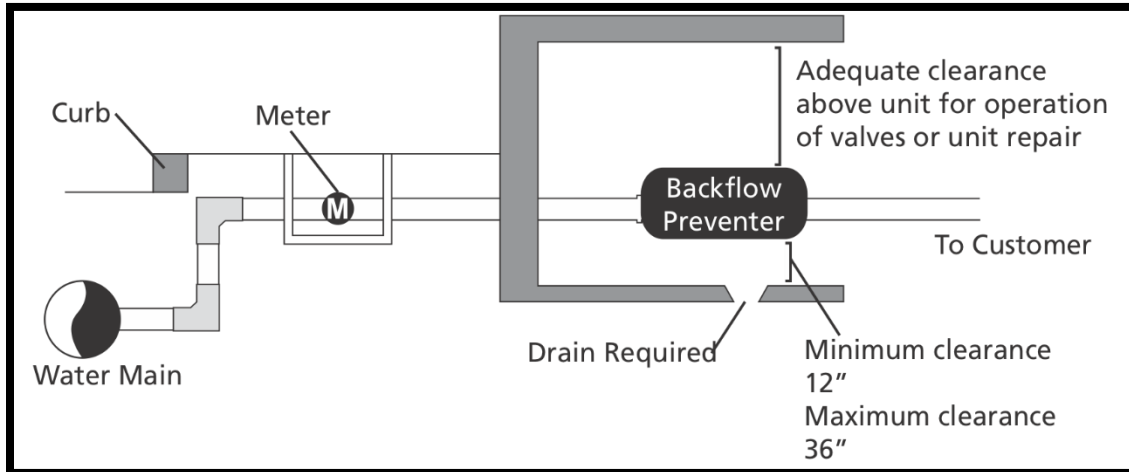


Exhibit C Continued Mechanical Backflow Assembly Installation Guidelines

Plan View Guidelines

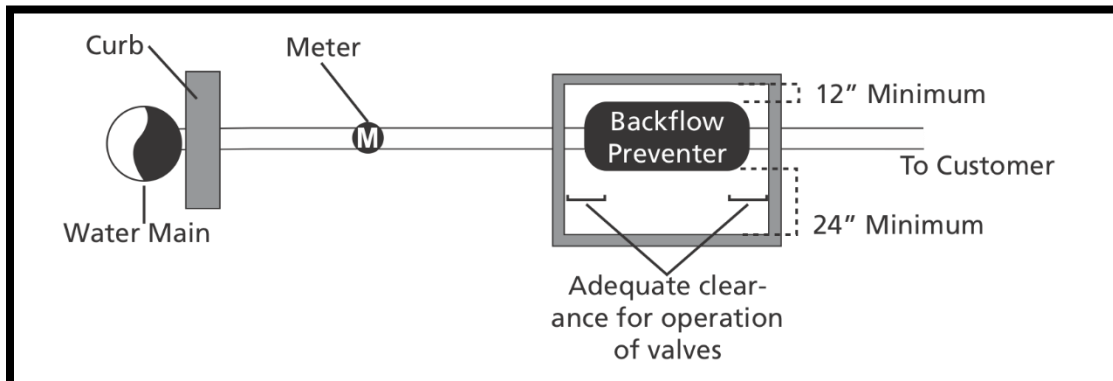


Exhibit D Pressure Vacuum Specific installation Requirements

