CROSS CONNECTON CONTROL AND BACKFLOW PREVENTION

Starting and Maintaining a Program for your Water System

BACKFLOW PREVENTION TYPES

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BACKFLOW PREVENTION

METHODS TO PROTECT CROSS CONNECTIONS AND PREVENT BACKFLOW

BACKFLOW PREVENTION TYPES

- BACKFLOW PREVENTION ASSEMBLIES
- BACKFLOW PREVENTION DEVICES
- AIR GAPS

BACKFLOW ASSEMBLIES

BACKFLOW ASSEMBLIES

- In line testable
  - Tested annually by a certified Backflow Assembly Tester
- In line repairable
- Isolation valves and test ports

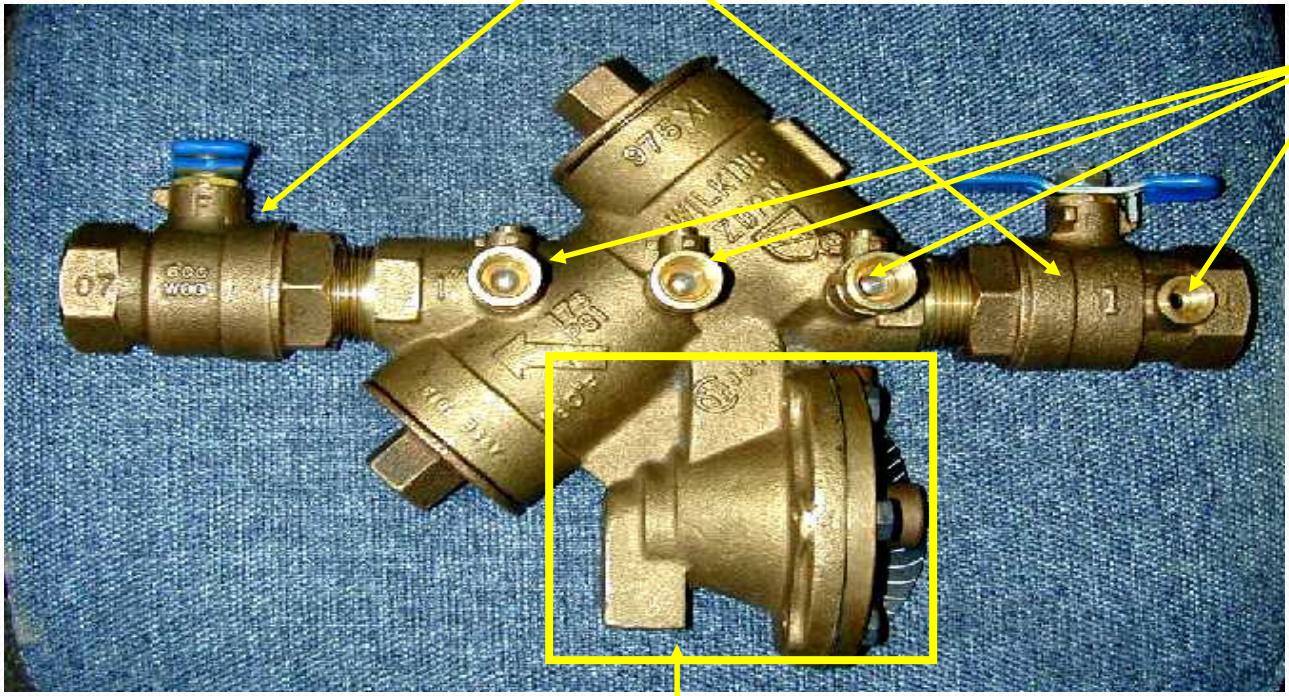
BACKFLOW ASSEMBLY TYPES

- Reduced Pressure Zone Backflow Assembly
- Double Check Valve Backflow Assembly
- Pressure Vacuum Breaker Backflow Assembly
- Spill Proof Vacuum Breaker Backflow Assembly

REDUCED PRESSURE ZONE (RPZ) BACKFLOW ASSEMBLY

MAINTAINING AS AN ASSEMBLY

ISOLATION VALVES (2)



TEST PORTS (4)

RELEIF PORT (1)

600
WOG
1X975

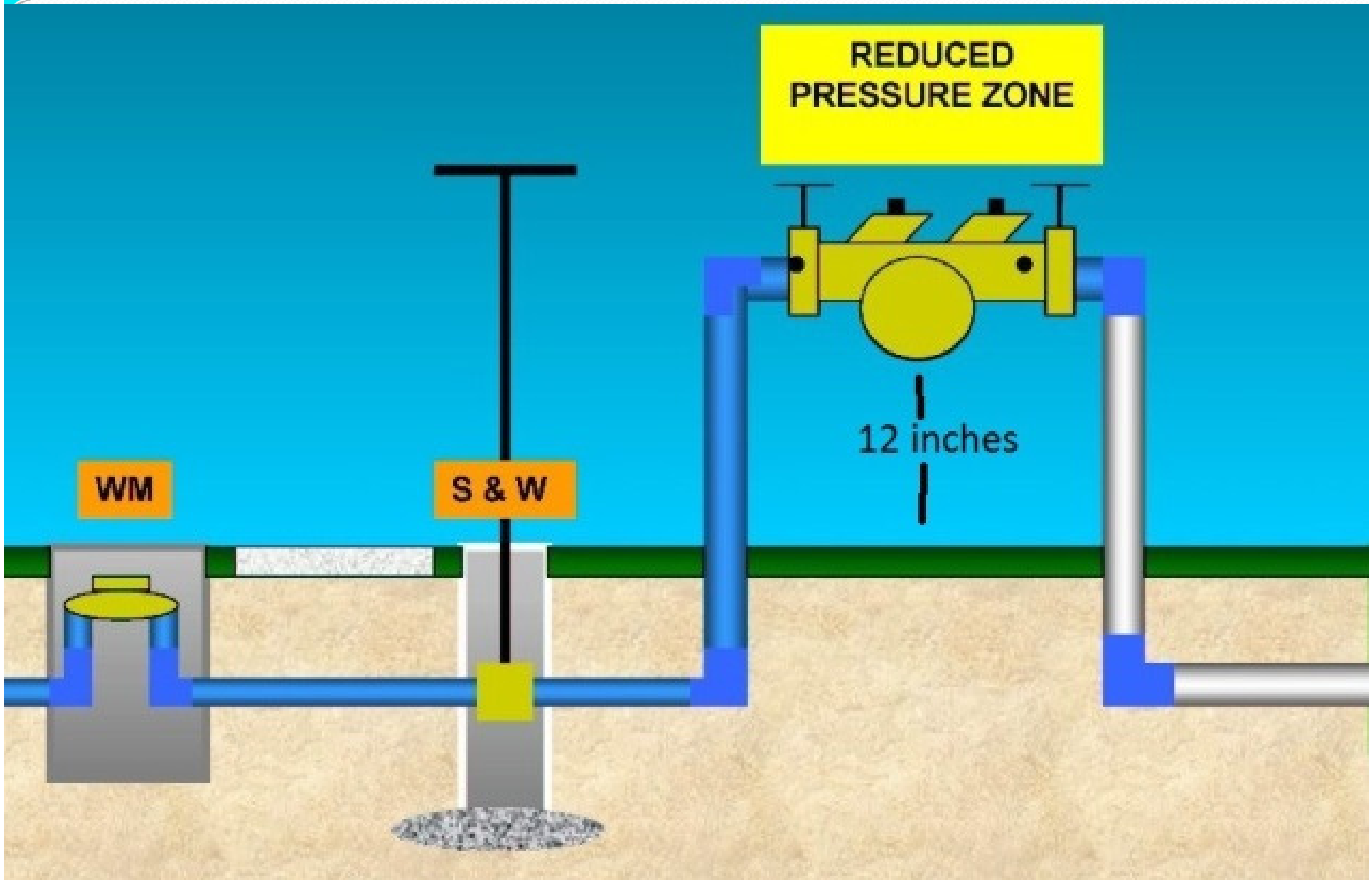
REDUCED PRESSURE ZONE BACKFLOW ASSEMBLY

- Approved For:
  - Approved for Backpressure and Backsiphonage
  - Health and Non Health hazards
- Common Applications
  - Landscape irrigation systems
  - Boilers
  - Chemicals

REDUCED PRESSURE ZONE (RPZ) BACKFLOW ASSEMBLY

- Installation Criteria
  - Installed horizontally only (unless 3rd party approved for vertical installation)
  - 12 inch clearance between relief port and grade line
  - May NOT be installed in a pit or a vault
  - Shall not be directly connected to a drain line

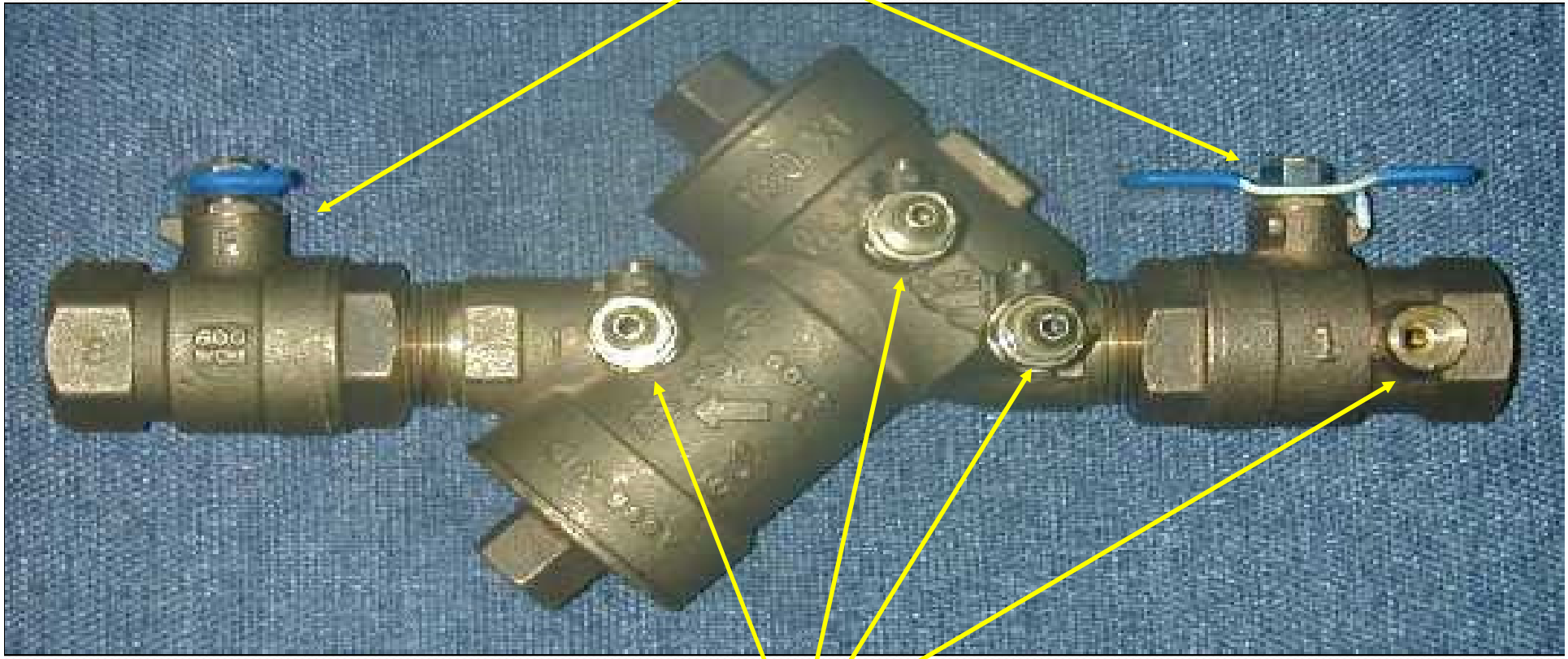
REDUCED PRESSURE ZONE BACKFLOW ASSEMBLY



DOUBLE CHECK VALVE BACKFLOW ASSEMBLY

MAINTAINING AS AN ASSEMBLY

ISOLATION VALVES (2)



TEST PORTS (4)

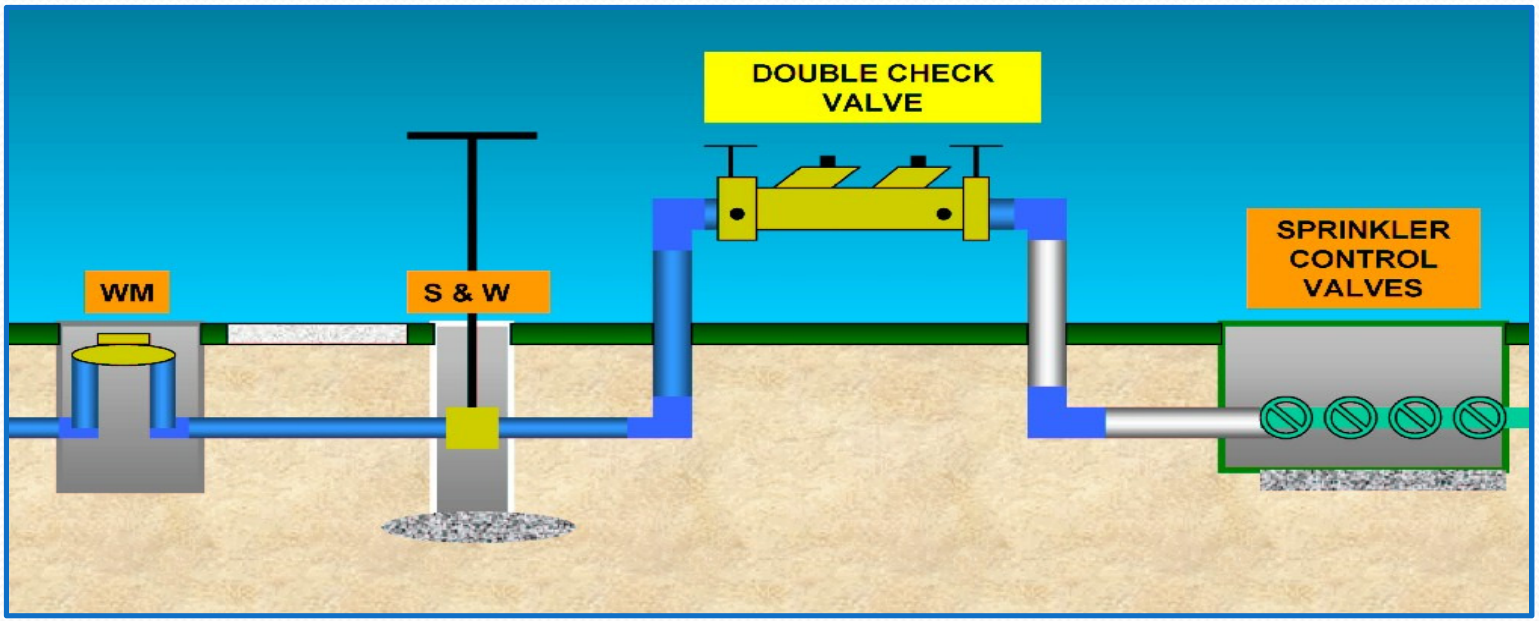

950 XI
600
WOG

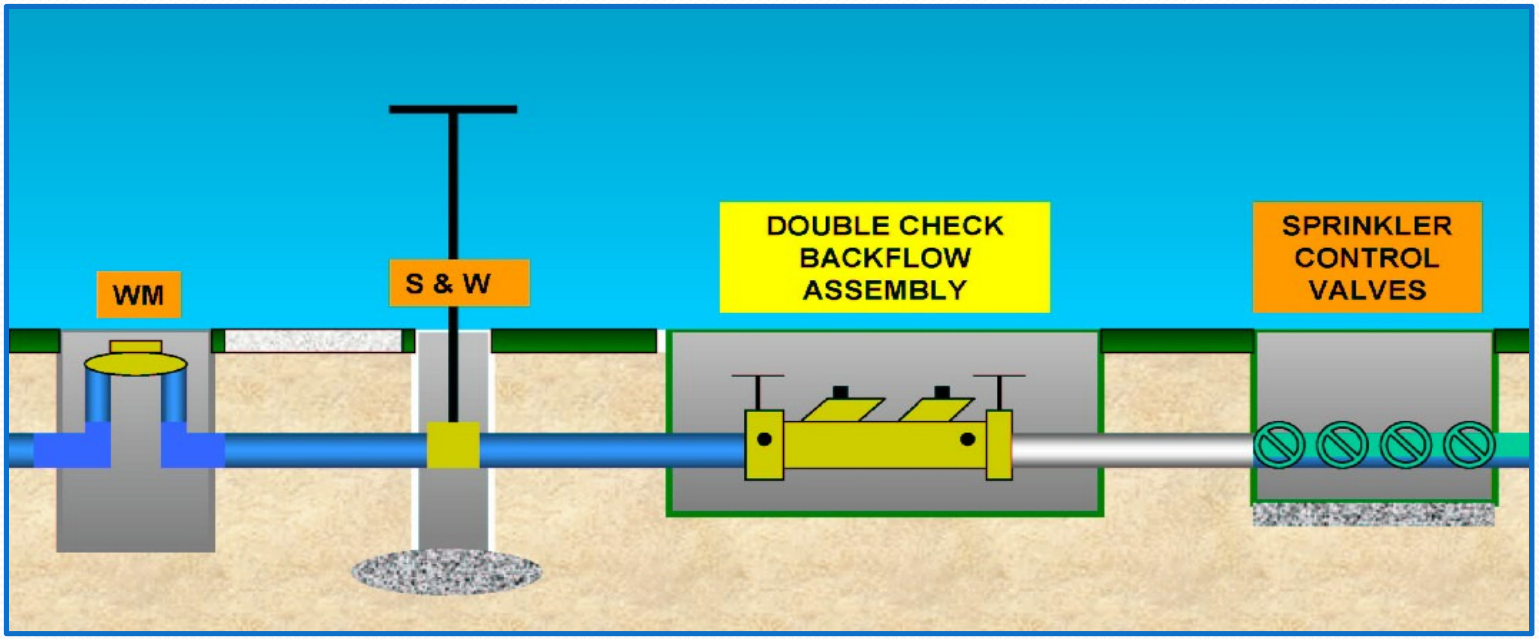
DOUBLE CHECK VALVE BACKFLOW ASSEMBLY

- Approved For:
  - Approved for Backpressure and Backsiphonage
  - Non Health hazard only
- Common Applications
  - Food service applications
  - Dairy
  - Bottling plants
  - Multi-story buildings
  - Fire suppression systems without hazardous chemical additives (class 1 & 2)

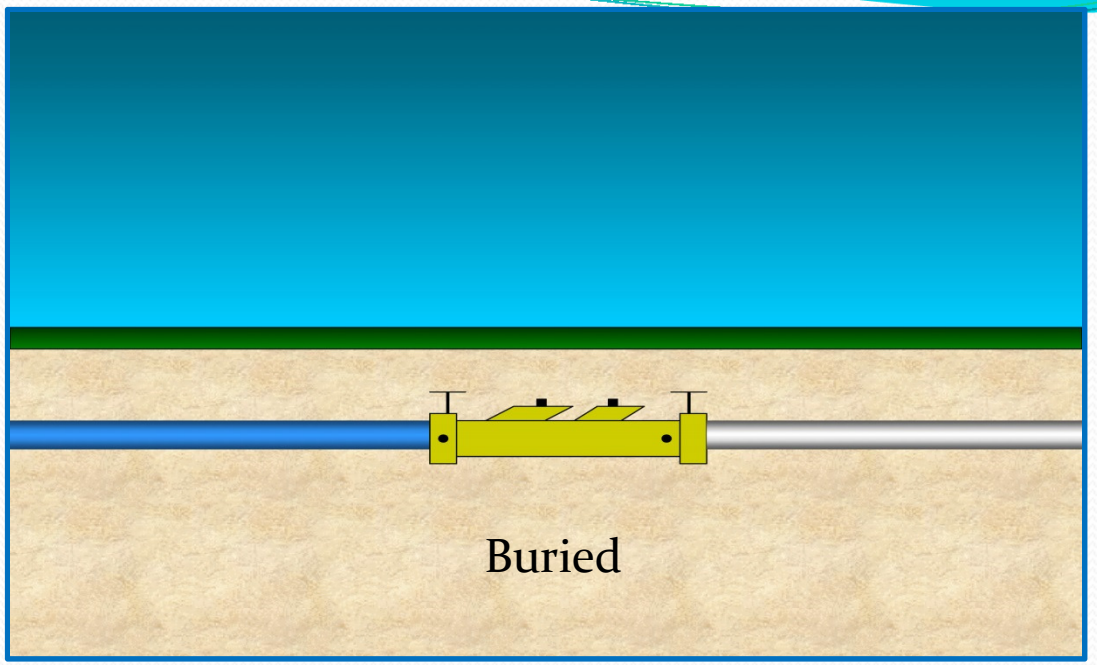
DOUBLE CHECK VALVE BACKFLOW ASSEMBLY

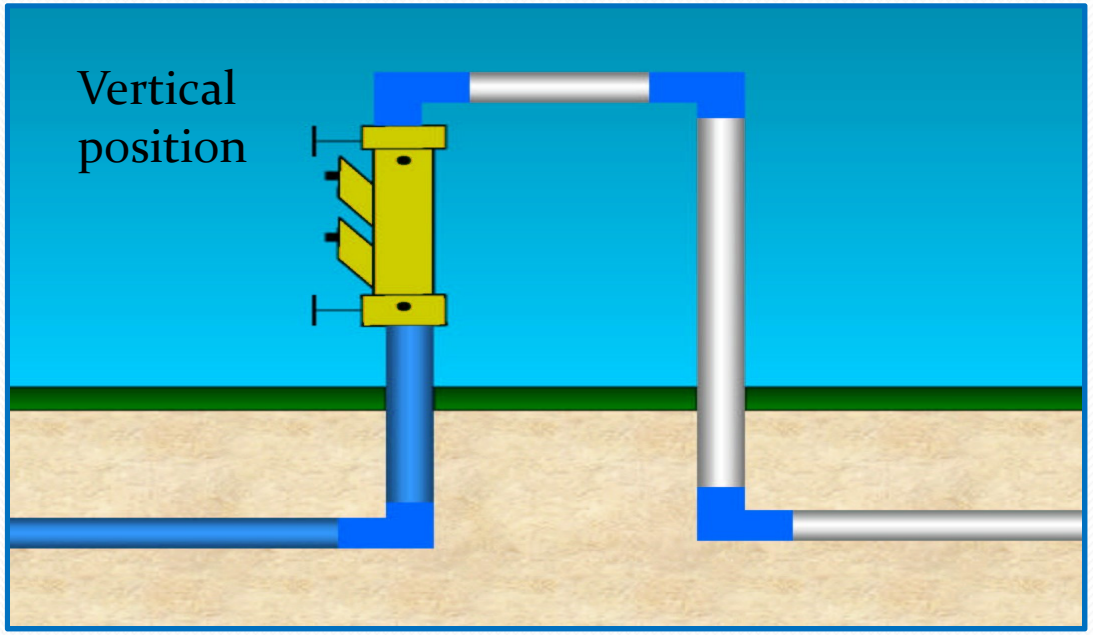
- Installation Criteria
  - Installed horizontally (unless 3rd party approved for vertical installation)
  - May be installed in a pit or a box
  - Be installed to facilitate repairs and testing (12 inches of clearance around assembly)


DOUBLE CHECK VALVE
WM
S & W
SPRINKLER CONTROL VALVES


WM
S & W
DOUBLE CHECK BACKFLOW ASSEMBLY
SPRINKLER CONTROL VALVES

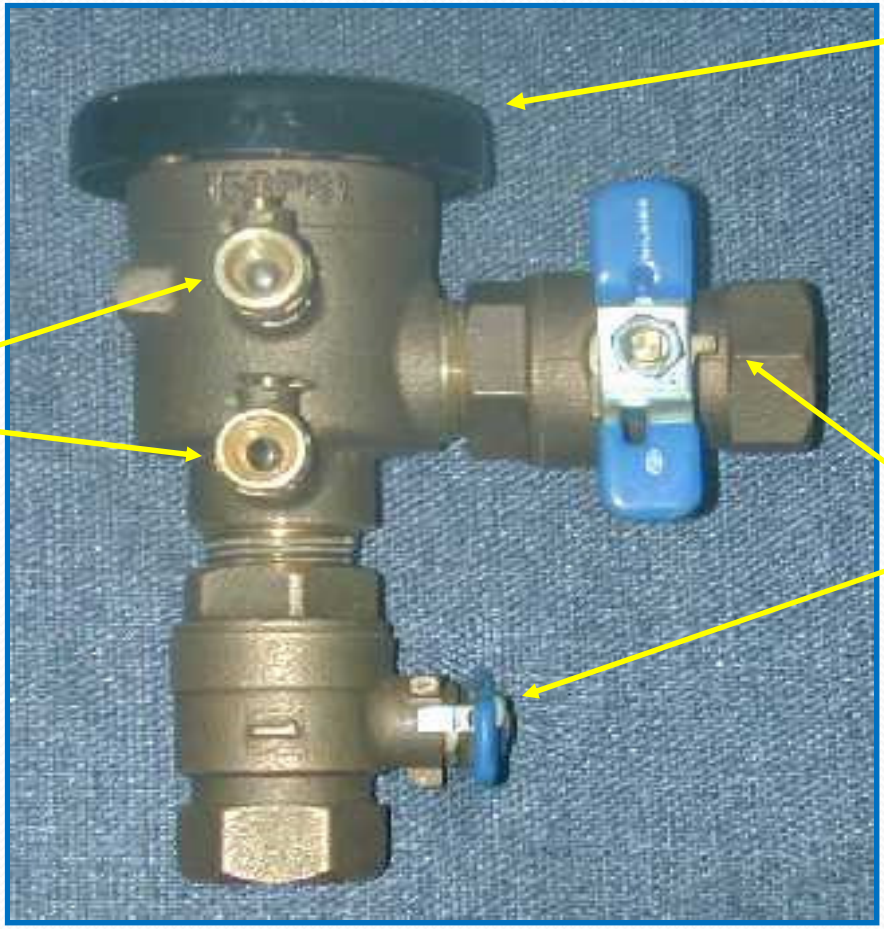
IMPROPER INSTALLATIONS





PRESSURE VACUUM BREAKER BACKFLOW ASSEMBLY

MAINTAINING AS AN ASSEMBLY



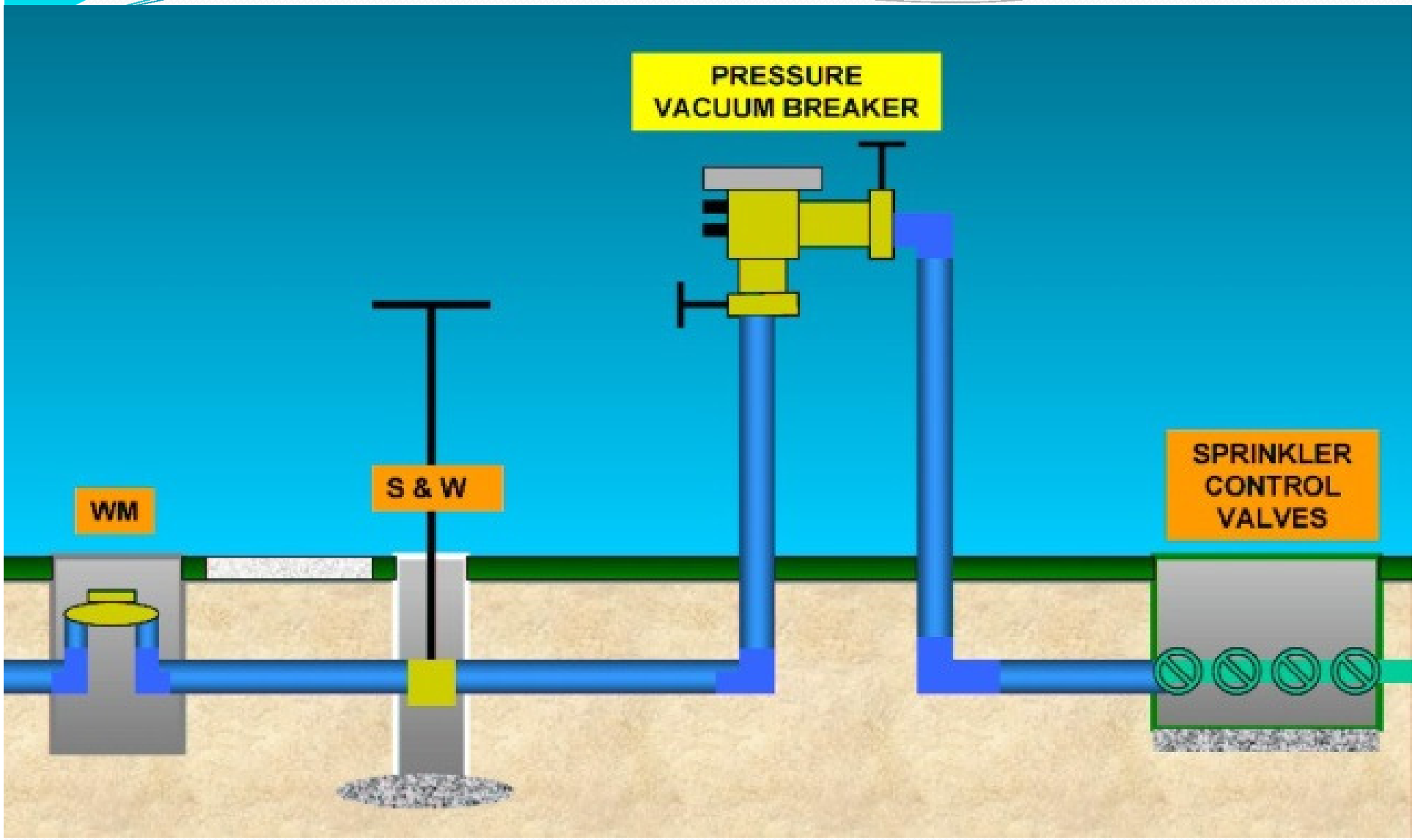
PRESSURE VACUUM BREAKER (PVB) SPILL RESISTENT VACUUM BREAKER (SVB)

- Approved For:
  - Approved for Backsiphonage
  - Approved Health and Non Health hazard
- Common Applications
  - Landscape sprinkling systems
  - Janitorial chemical dispenser
  - Food service
  - Wash down hoses

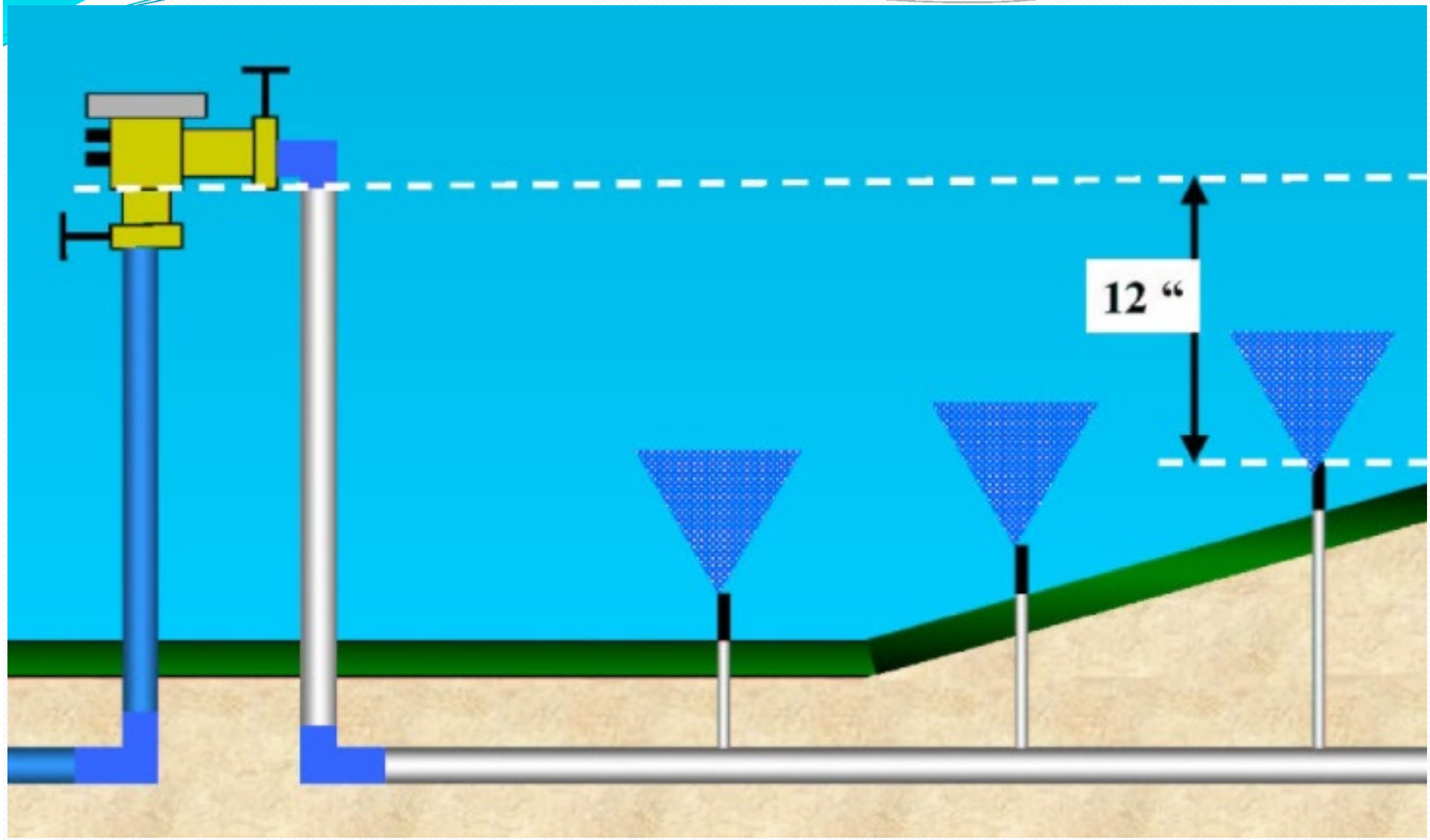
PRESSURE VACUUM BREAKER (PVB) SPILL RESISTENT VACUUM BREAKER (SVB)

- Installation Criteria
  - **MUST BE** INSTALLED VERTICALLY
  - INSTALLED 12 INCHES ABOVE ALL DOWN STREAM PIPING AND WATER USE
  - **SHALL NOT** BE IN A PIT OR BELOW GRADE
  - SHALL NOT BE SUBJECTED TO BACKPRESSURE

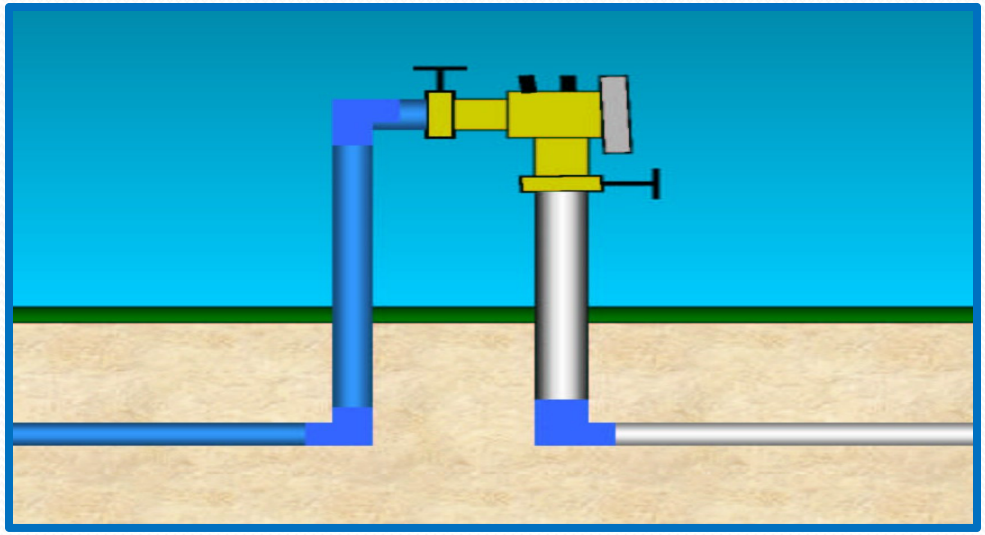
PRESSURE VACUUM BREAKER (PVB)

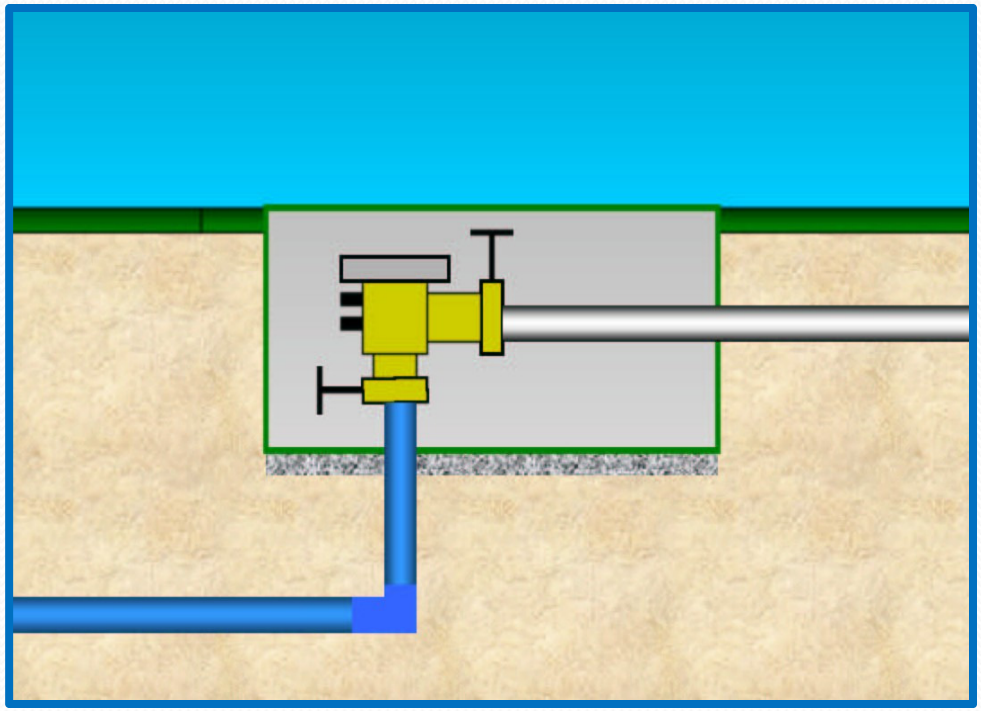


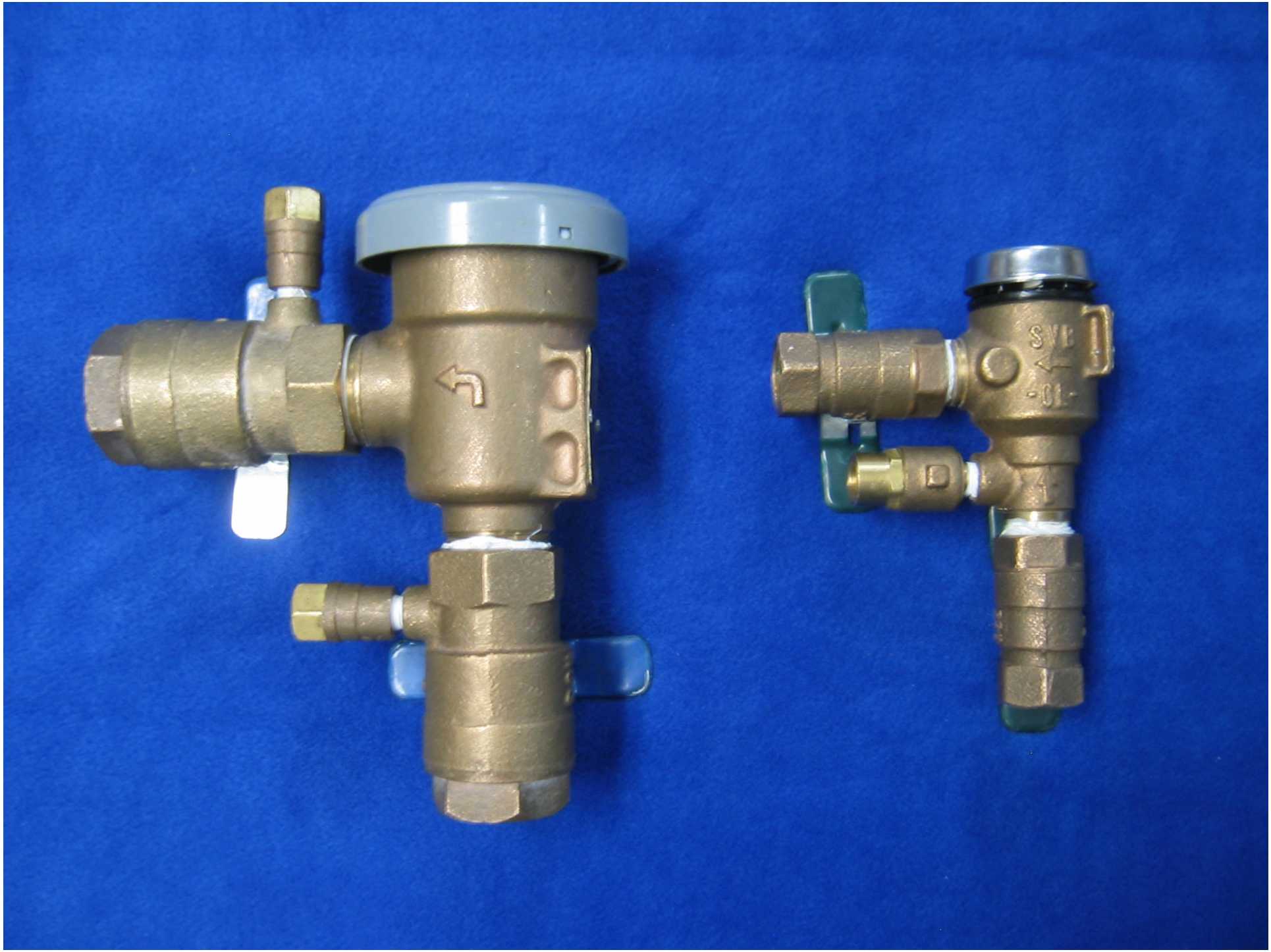
PRESSURE VACUUM BREAKER (PVB)



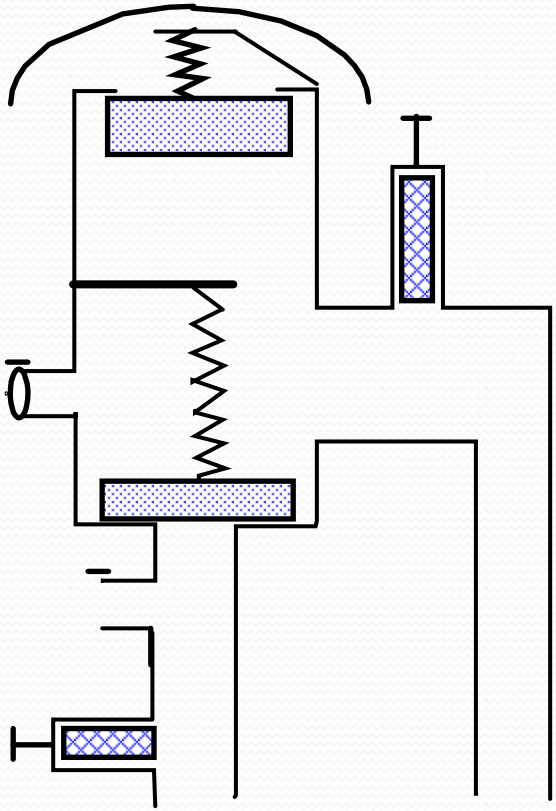
IMPROPER INSTALLATIONS



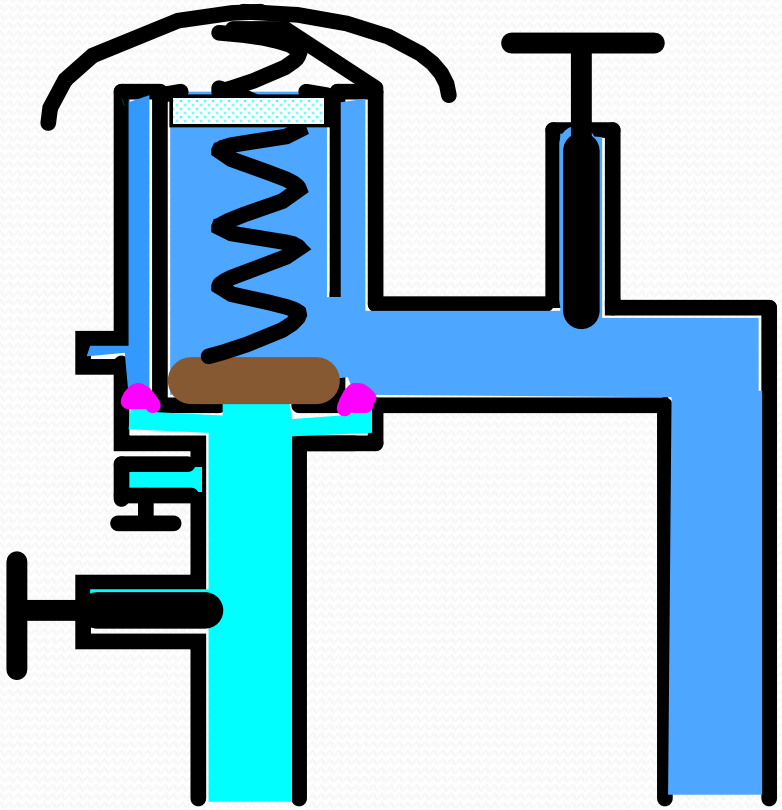




PVB



SVB



BACKFLOW ASSEMBLY TESTING

All backflow prevention assemblies must be tested annually by a Utah certified Backflow Assembly Tester

BACKFLOW ASSEMBLY TESTING

Using 10th Edition USC Testing Procedures

- **TEST VALUE REQUIREMENTS**
  - **Reduced Pressure Zone (RPZ)**
    - #1 Check – 5.0 psid or above
    - #2 Check – Recorded as Closed Tight or Leaked
    - Relief Port Opening point – 2.0 psid or above
  - **Double Check Valve (DC)**
    - #1 Check – 1.0 psi or above
    - #2 Check – 1.0 psi or above

BACKFLOW ASSEMBLY TESTING

Using 10th Edition USC Testing Procedures

- **TEST VALUE REQUIREMENTS**
  - **Pressure Vacuum Breaker (PVB)**
    - Air Poppit – Opens at 1.0 psi or above
    - Check Valve – 1.0 psi or above
  - **Spill Proof Vacuum Breaker (SVB)**
    - Check Valve – closes 1.0 psi or above
    - Air Poppit – Opens 1.0 psi or above

BACKFLOW DEVICES

BACKFLOW DEVICES

- Self Contained
- Non-testable (Visual Inspection only)
- Generally Not In line repairable
- NO Isolation valves and test ports

BACKFLOW DEVICE TYPES

- Atmospheric Vacuum Breakers
- Hose Bib Vacuum Breakers
- Dual Check Valves
- Dual Check Valve with Atmospheric Vent

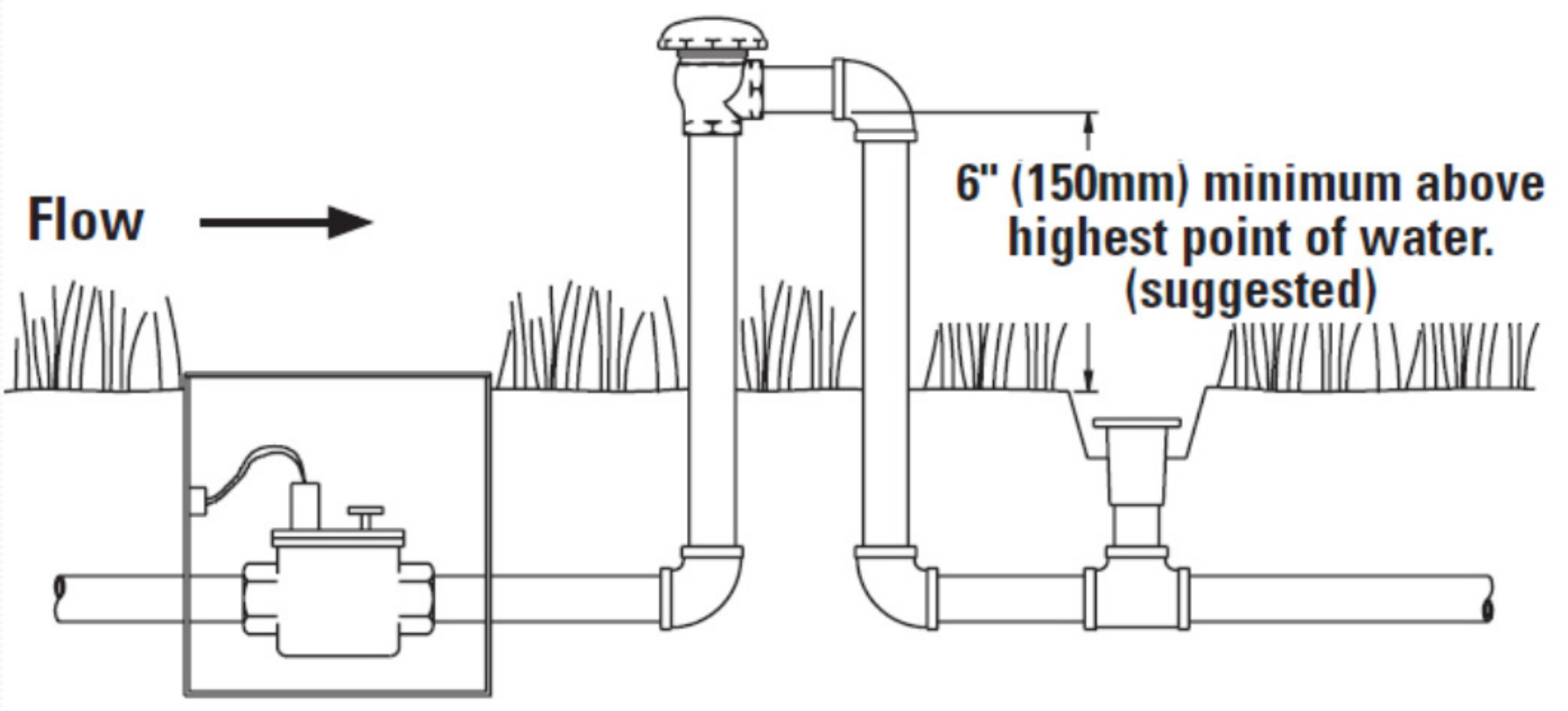
ATMOSPHERIC VACUUM BREAKER (AVB)

- Approved Use
  - Health and Non- Health
  - Backsiphonage ONLY

ATMOSPHERIC VACUUM BREAKER (AVB)

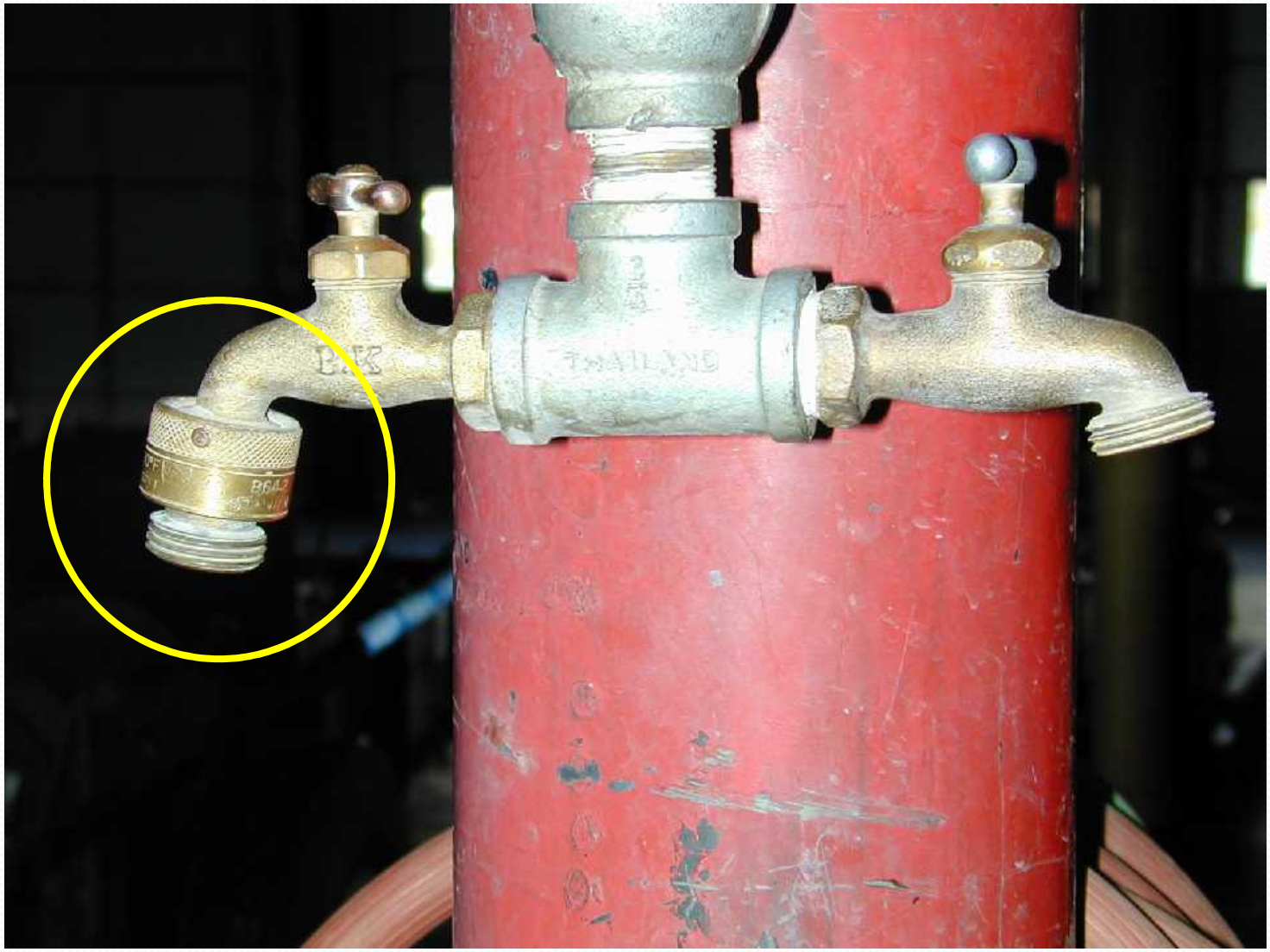
- Installation Criteria
  - Vertical Position ONLY (Air inlet up)
  - NO MORE than 12 hours continuous pressure in a 24 hour period
  - 6 inches above any downstream piping and water usage
  - Not subjected to backpressure
  - NO downstream valves
  - No pits

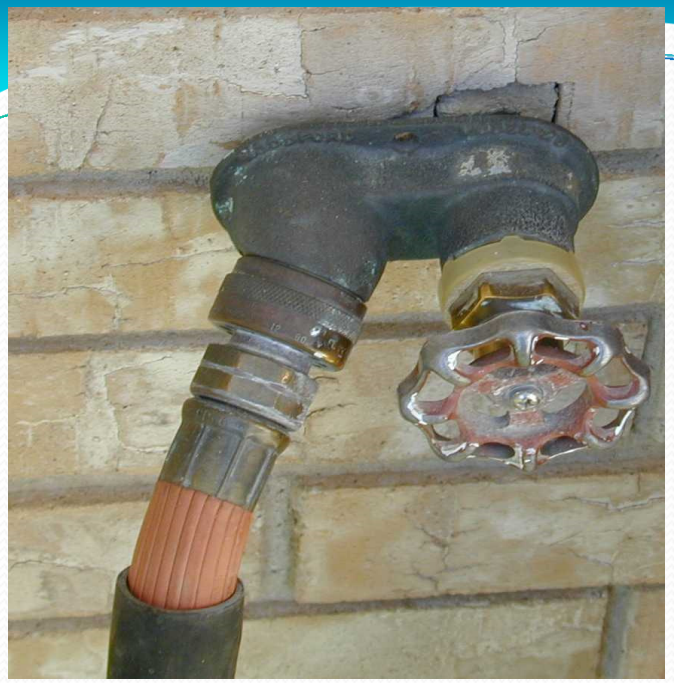
ATMOSPHERIC VACUUM BREAKER (AVB)



HOSE BIB VACUUM BREAKER

- Approved Uses
  - Health and Non-health Hazards
  - Back siphonage
  - Low head backpressure
  - **Threaded hose Connections ONLY**
  - Non-Removable
- Maintenance
  - Drain for winter
  - Remove hoses when not in use


THAILAND

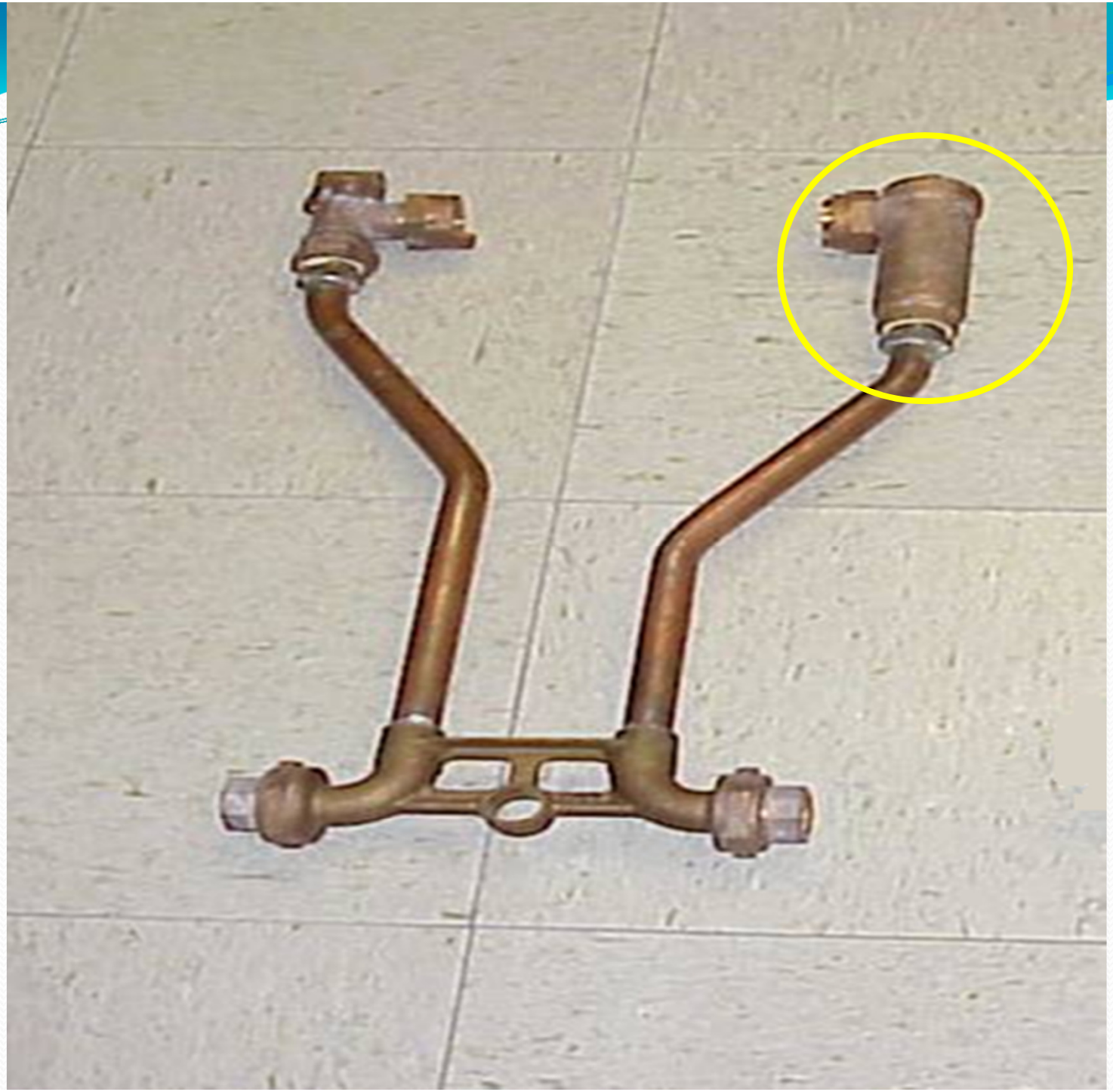



CASH-ACME

DUAL CHECK VALVE

- Approved uses
  - Approved for residential meter pit installations ONLY
  - Non-health
  - Water purveyor typically installs and maintains as secondary protection
  - Recommended 10 percent be tested or replaced each year by the water purveyor

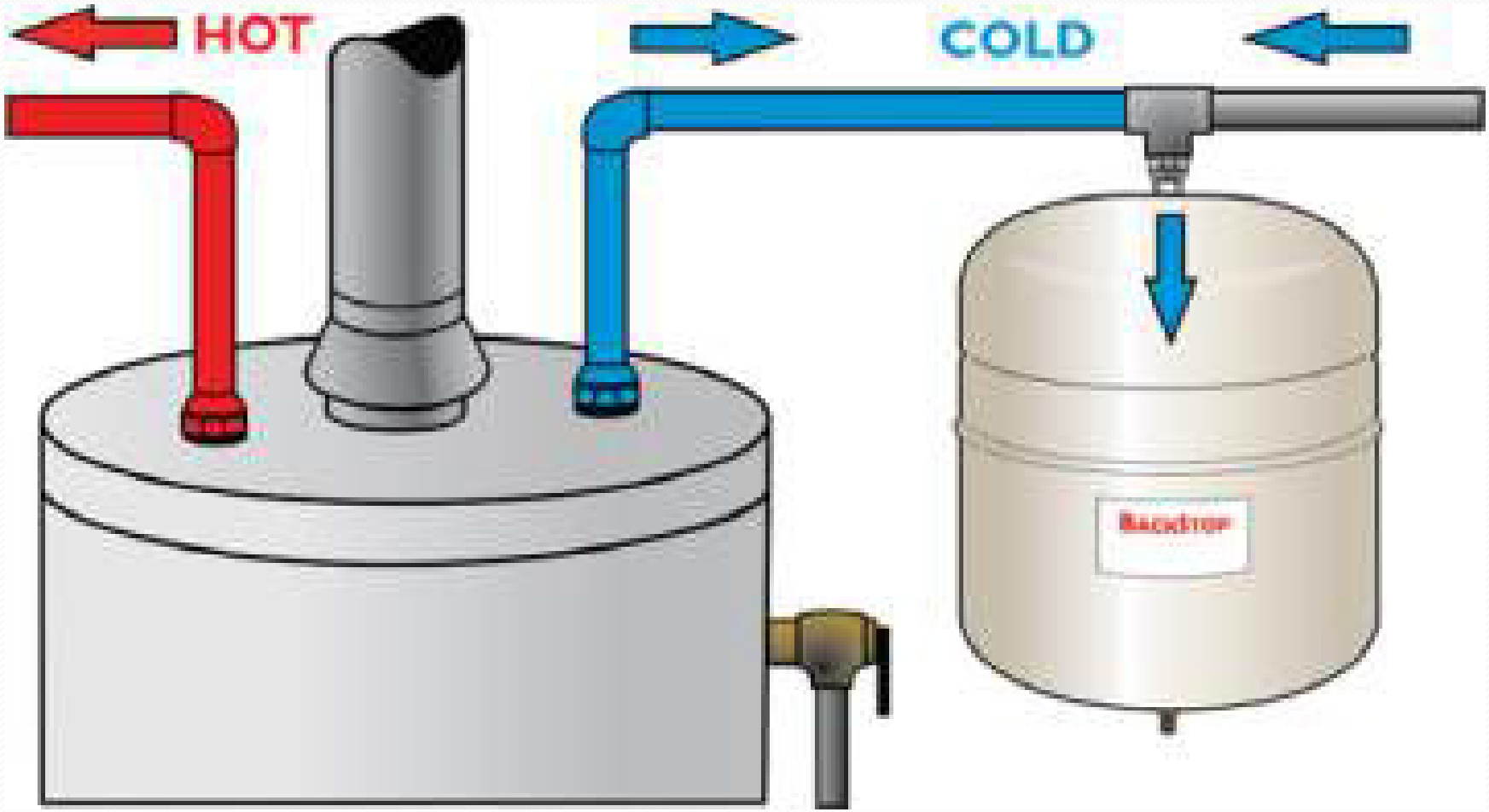
Dual Check Valves



THERMAL EXPANSION

- Must address thermal expansion!
  - MUST notify the customer of the dangers of thermal expansion
  - Thermal Expansion Tanks are installed by customer

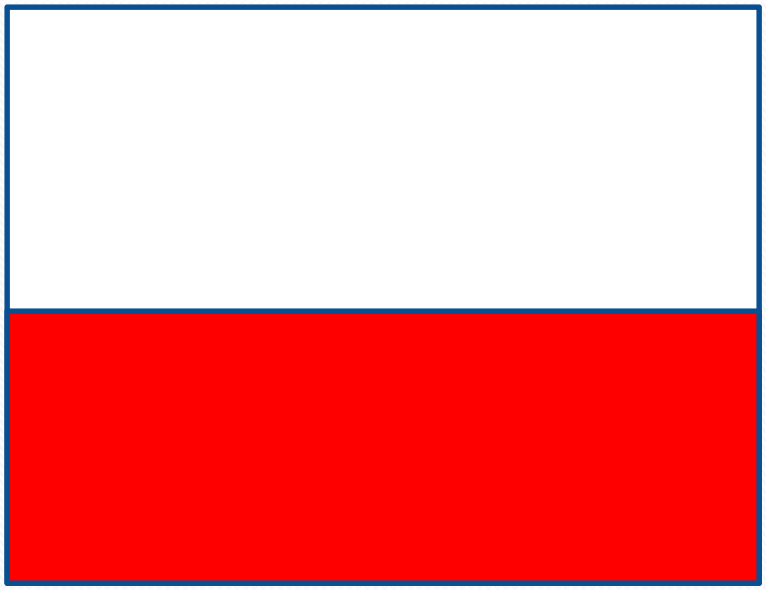
THERMAL EXPANSION TANK



THERMAL EXPANSION TANK

AIR GAP

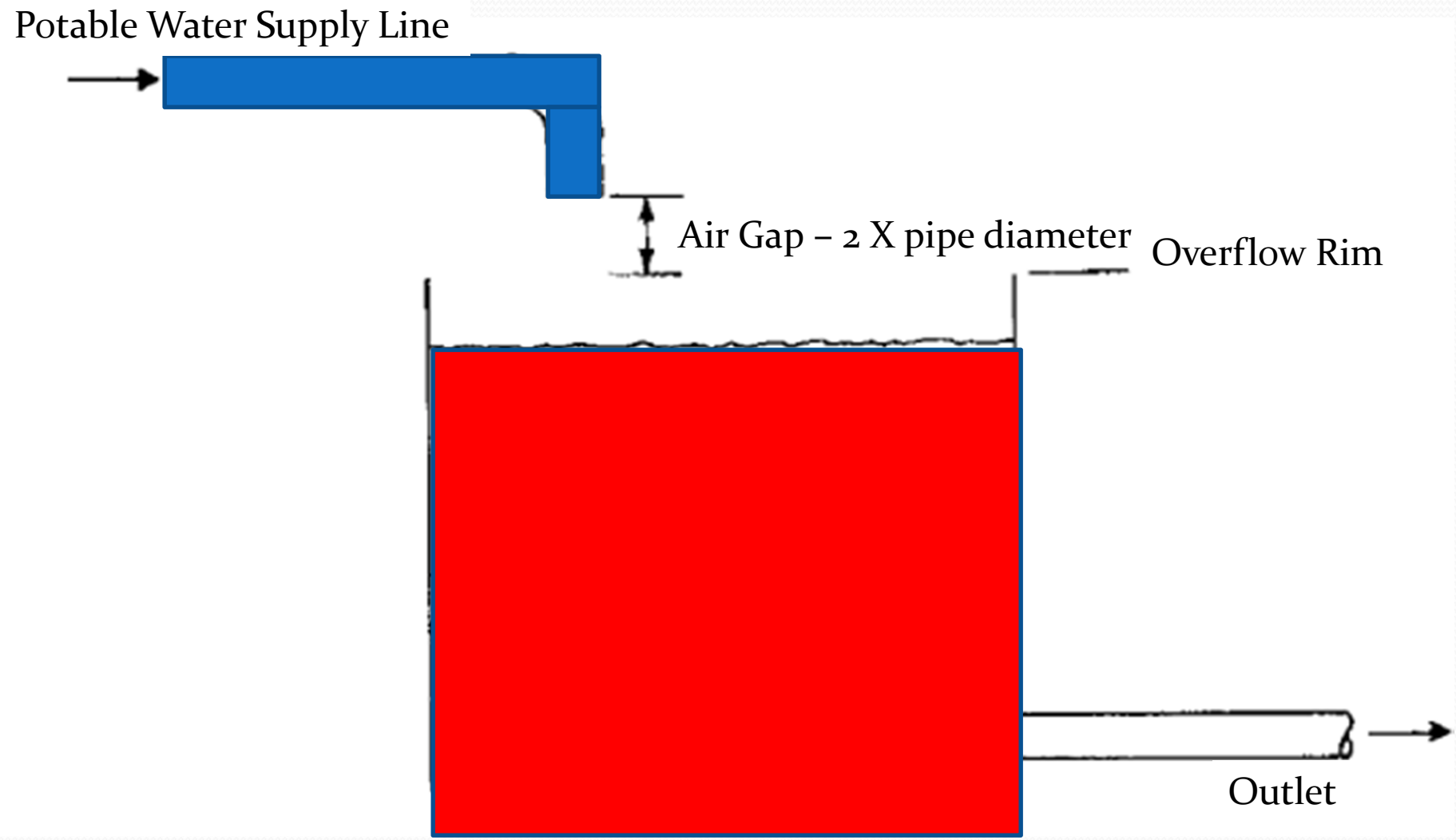
Air gap means a physical separation between the discharge end of a drinking water supply pipe and a receiving vessel



AIR GAPS

- Ultimate backflow protection
- Approved for Health and non-health
- High health hazard air gaps shall be inspected annually
- Physical Separation
  - 2 X pipe diameter
  - 1 inch minimum
  - Next to an obstruction
    - 3 X pipe diameter or
    - 1.5 inch minimum

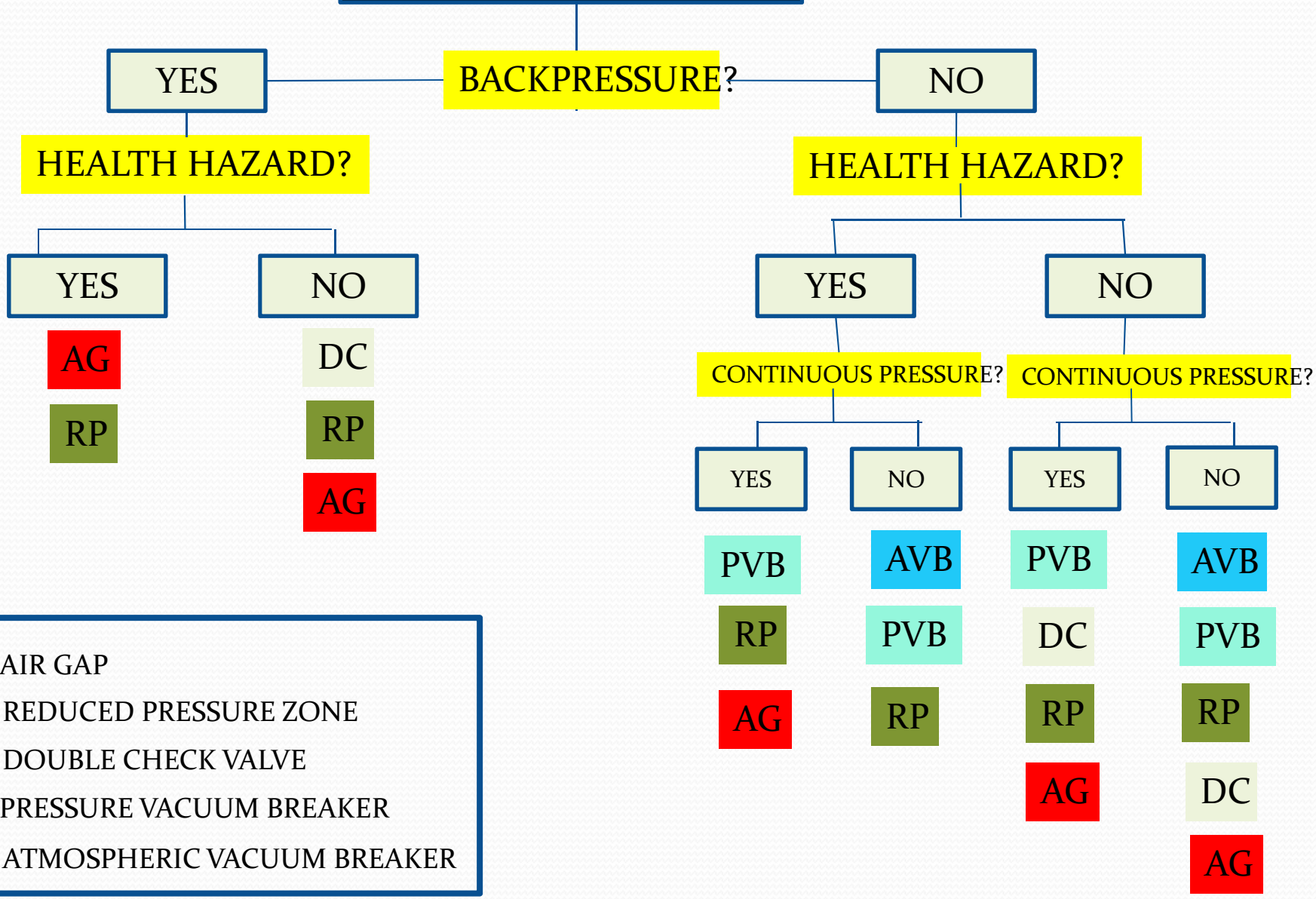
AIR GAPS


Potable Water Supply Line
Air Gap – 2 X pipe diameter
Overflow Rim
Outlet

AIR GAP

DETERMING WHICH TYPE OF BACKFLOW PREVENTION TO USE

WHAT IS GOING ON IN THE BOX?



AG	AIR GAP
RP	REDUCED PRESSURE ZONE
DC	DOUBLE CHECK VALVE
PVB	PRESSURE VACUUM BREAKER
AVB	ATMOSPHERIC VACUUM BREAKER

	INDIRECT CROSS CONNECTION BACKSIPHONAGE ONLY		DIRECT CROSS CONNECTION BACKSIPHONAGE AND
HEALTH HAZARD	CONTINUOUS USE PVB/SVB RP AIR GAP	NON- CONTINUOUS USE AVB PVB/SVB RP AIR GAP	RP AIR GAP
NON HEALTH HAZARD	PBV/SVB RP DC AIR GAP	AVB PVB/SVB DC RP AIR GAP	DC RP AIR GAP