

# **WASHINGTON SUBURBAN SANITARY COMMISSION**

## **2011 WSSC PLUMBING & FUEL GAS CODE**

### **Amendment # 2 Additional and Modified Sections Only**

The following 28 pages of this document present only the additional and modified Sections of the 2011 WSSC Plumbing and Fuel Gas Code collectively approved as Amendment # 2.

A comprehensive, updated, and color coded version of the entire Code is downloadable free of charge from WSSC's web page:

<http://www.wsscwater.com/home/jsp/content/plumb-gas-code.faces>.

Or printed versions are available from the WSSC Permit Services counter for a cost of \$25.

See the following page for an explanation of formatting and effective date.

# WASHINGTON SUBURBAN SANITARY COMMISSION

## 2011 WSSC PLUMBING & FUEL GAS CODE

**Effective Date:** February 1, 2011

(Amendment #1: Chapter 7; Effective Date July 1, 2011)

(Amendment #2: Various Sections; Effective Date July 1, 2012)

### CERTIFICATION OF AUTHORITY

The General Counsel certifies that the statutory authority for the adoption of this Code is:

Annotated Code of Maryland:

Maryland Public Utilities Article:

§§ 17-403, 17-404, 17-406, 23-101, 24-101, 24-102, 24-103, 24-104, 24-105, 24-106, 24-201, 24-801, 25-101, 25-105, 29-101, 29-102, 29-103, 29-105, 29-107

Business Occupations and Professions Article:

§§ 12-305, 12-307

Environment Article:

§9-332

Explanation of Formatting:

Printed Version (Black & White) – Additions and revisions between this version of the Code and the previous Code are shown with a thick vertical line in the right margin as shown immediately to the right.

-Deletions are shown with a horizontal arrow as shown to the right.

Electronic Version – in addition to the margin indicators present in the print version, the electronic version also features blue colored text to indicate an addition or revision.

WSSC amendments to the International Fuel Gas Code formerly contained in Chapter 5 of this Code have been relocated to the previously vacated Chapter 4.

Chapter 5 of this Code now incorporates consolidated Cross-Connection Control provisions: The 2010 WSSC Cross-Connection Control Program Manual; International Plumbing Code Section 608; and former revisions to IPC 608 have been merged to create this new Chapter.

**101.3.2 Referenced Codes and Standards.** Other International Code volumes referenced in the IPC and the IFGC, and the standards referenced therein (IPC-Chapter 13 and IFGC-Chapter 8) shall be considered part of the requirements of this Code to the prescribed extent of each such reference. Where the requirements of referenced standards or manufacturer's installation instructions do not conform to minimum provisions of this Code, the provisions of this Code shall apply.



**101.4.2 Systems and Equipment Outside of the Scope.** This code shall not apply to items listed in the current adopted version of the International Fuel Gas Code, Section 101.2.4.

**102.8 Special Exception, Federal Property.** Pursuant to federal regulation or written agreement, where property is owned by the federal government and where buildings are being erected or improved, plumbing, fuel gas and/or site utility systems shall not require WSSC permits or inspections. For requirements on the federal government, see Section 102.8.3 below.

**102.8.1 Exemption Not Applicable.** This exemption does not apply to property or buildings under lease or condominium ownership. This exemption also does not restrict the federal government from securing permits and scheduling inspection in cases where the government desires the Commission's inspection of plumbing, fuel gas, or site utility systems.

**102.8.1.1 Voluntary Request for Permits and Inspections.** Where work is performed by federal agency staff and permits and inspections by WSSC are desired, each federal agency or campus shall register per Section 113.5. Where contract work will be performed on federal property and permits and inspections by WSSC are desired, contracting firms shall be registered per Section 113.1.

**102.8.2 Regulatory Compliance.** This exemption does not exempt the federal government from compliance with other specific provisions of this code: Chapter 5 - Cross-Connection Control; Chapter 8 - Industrial Discharge Control (Pretreatment); or Sections 302.10, 804 and 818 - Fats, Oil & Grease Program.

**102.8.2.1 Cross Connection Control.** The Commission shall issue a special license to each federal property for the sole purpose of submitting and tracking backflow test reports. No other permit or inspection activities will be allowed under this license. See Chapter 5 for Cross Connection/backflow prevention requirements.

**102.8.3 Federal Property Application Requirements.** Federal property improvement projects are required to apply for hydraulic planning analysis so WSSC can evaluate existing and projected water and sewer flow demands. Application is required for meters, service connection, and/or WSSC system extension. Application, site utility plans, and plumbing plans are required in order for WSSC to determine applicable System Development Charges. In all cases, the federal government is responsible for all fees and charges associated with these Commission business functions.

**104.9 Liability.** The code official, member of the WSSC Plumbing and Fuel Gas Board, or other employee charged with the creation and/or enforcement of this code, while acting for the Commission in good faith and without malice in the discharge of the duties required by this code or other applicable regulation or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damages accruing to persons or property as a result of an act or by reasons of an act or omission in the discharge of official duties.

**104.9.1 Defense.** Any suit instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the Commission until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

**106.1.1 General.** Any owner, authorized agent or contractor who desires to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any plumbing, site utility, fuel gas appliance, or fuel gas system, the installation of which is regulated by this Code, or to cause any such work to be done, shall *first* make application to the Commission and obtain the required permit for the work. All work identified in this Code, except for "Exempt Work" set forth in Section 106.2, shall be installed under a Long Form or Short Form Plumbing/Gasfitting permit, or under a Site-Utility permit.

**106.1.2.1 Disclosure.** The Licensee shall be responsible for notifying the property owner or owner's agent of all permit and inspection requirements associated with the work performed prior to installation.

**106.2.3 Plumbing Maintenance.** The clearing of stoppages in fixture branches; the repairing of incidental leaks in pipes, valves or fixtures; the removal and reinstallation or replacement of existing plumbing fixtures, residential type plumbing appliances including electric water heaters, non-testable backflow devices, and plumbing appurtenances; provided that such repairs *do not* involve or require the replacement of *concealed* piping, or the rearrangement of valves, pipes or fixtures.

**106.2.5 Special Exception, Natural Gas Utility Companies.** Gas Utility personnel or their subcontractors may perform a limited "house line" alteration for a Group R-3 occupancy without a permit. This house line alteration shall only be allowed when the gas meter is relocated from inside to outside as part of the utilities' system maintenance. The scope of work shall be subject to same limits and parameters described in the "Twelve Joint Rule," as set forth in Section 402.4. Meter relocations exceeding the limits of the Twelve Joint Rule or those initiated by the property owner or the owner's agent shall require a Short Form permit and inspection as required by this code.

**106.2.6 Federal Property Exempt.** See Sections 102.8.

**106.5.1 Electronic Submittal Required.** Design plans and other required supporting documentation shall be submitted to the WSSC in accordance with applicable electronic submittal and related checklist protocols.

**106.8.1 Expiration.** A Long Form permit shall expire if the work authorized by the permit does not pass an inspection within 18-months from the date of issuance of the permit, or if the work authorized by the permit does not pass another progress inspection or final inspection within 18-months from the last performed inspection.

**106.8.1.1 Re-activation.** Before the original permitted work can be recommenced, the current minimum long form permit fee must be paid as a re-issue fee. In addition, the current amount for inspection fees and System Development Charges (SDC) shall be due for additional fixtures and the difference in SDC is due for existing permitted fixtures based on the originally permitted fee.

**106.9.3 Activation.** A Short Form permit shall be activated through the scheduling of the inspection upon completion of the work.

**106.9.3.1 Present During Work.** WSSC Short Form Permits shall be on the jobsite at the time of installation.

**106.9.3.2 Timely Activation.** All required inspections, including new or replacement gas appliances, shall be scheduled for inspection to occur as soon as practical, but not to exceed 10 business days from the date of installation.

**106.9.3.3 Obstructed Process.** If the property owner or agent of the owner obstructs or refuses to allow the licensee to schedule the inspection required under 106.9.3.2, the licensee shall promptly notify WSSC in writing. The notification shall occur within 15 days of installation and it shall include: property owner or owner agent's name; mailing address, job address, phone number(s), email address, permit number, and documentation of attempts to schedule the inspection.

**106.9.4 Expiration.** A Short Form permit shall expire if not activated four (4) months from the date of purchase, without benefit of refund.

**106.9.4.1 Failed Inspection.** Active Short Form permits shall expire 60 days from the date of a disapproved inspection.

**106.9.4.2 Reuse or Refund.** A Short Form permit scheduled in error shall not be reused or refunded.

**106.11.4.1 Codebook.** Depending on the type of work to be performed, the applicant shall be required to obtain the current approved versions of the WSSC Plumbing and Fuel Gas Code and the International Plumbing Code.

**107.1.1 Federal Property Exempt.** See Section 102.8.

**107.2.2.2 Short Form Permit.** Subject to Sections 106.9.3.2 and 106.9.3.3, an inspection shall be completed within 10 business days of installation; and prior to concealment where applicable.

**108.4.7 Negligence, Incompetence, or Misconduct.** Committing acts constituting negligence, incompetence or misconduct while providing plumbing, gas fitting, site-utility, sewer and drain cleaning, or waste hauling services, or while assisting in providing these services.

**108.5 Un-licensed Work Subject to Criminal Liability.** Where an individual or a group of individuals willfully advertised, solicited, contracted and/or performed plumbing, gasfitting, site-utility, sewer and drain cleaning, or waste hauling services without proper licenses or permits, the individual or group of individuals may be subject to civil liability and criminal prosecution under Maryland law.

**108.6 Termination of Service.** A property owner is subject to termination of water, sewer, or gas service where any of the following conditions exist:

**108.6.1** The property owner engaged in plumbing work without required authorization; or failed to schedule the required inspection for permitted work.

**108.6.2** The property owner engaged in gasfitting work, without a license.

**108.6.3** The property owner has been uncooperative or untimely in obtaining a licensed individual to rectify unauthorized plumbing or gasfitting work.

**108.6.4** The property owner is aiding or abetting an unlicensed individual or unregistered firm who performed plumbing or gasfitting services on his/her property.

**108.8.1.3 Gross Negligence, Incompetence, or Misconduct.** Was guilty of bribery or attempted bribery of a Code Official; misconduct while interacting with a Code Official; or gross negligence, incompetence, or misconduct while providing or assisting in providing plumbing, gasfitting, site utility, drain and sewer cleaning, or waste hauling services. A failed routine inspection of permitted work shall *not* be considered as gross negligence, incompetence or misconduct.

**111.1.6 Existing Sewer Connection.** New buildings utilizing a previously un-used existing sewer service connection, and existing buildings having the building sewer replaced, shall be required to have a property line cleanout installed within 1-foot of the property line, or at the edge of the right-of-way in the case of right-of-way connections, if such a cleanout does not already exist. The base connection shall be a combination wye and one-eighth bend lying on its back. The cleanout cover assembly shall conform with WSSC Standard Detail S-5.1 or S-5.2.

**113.5.2 Federal Property Exempt.** See Section 102.8.

**113.8.5.3 Exception.** Where the owner or owner's agent obstructs or refuses to allow inspection, the warranty requirements shall not apply to the work subject to inspection, provided the licensee has notified the Commission in accordance with Section 106.9.3.3.

## **SECTION 202 ADDITIONAL DEFINITIONS**

**AIR-GAP.** The unobstructed vertical distance through free atmosphere between the lowest effective opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. These vertical, physical separations must be at least twice the effective opening of the water supply outlet, never less than 1 inch above the receiving vessel flood rim. Special conditions may require more stringent requirements.

**ANSI.** American National Standards Institute.

**APPROVED.** Accepted by WSSC as meeting an applicable standard, specification, requirement, or as suitable for proposed use.

**ASSE.** American Society of Sanitary Engineering.

**ASSEMBLY.** A testable backflow preventer with one or more approved body components and including approved valves.

**ATMOSPHERIC VACUUM BREAKER (AVB).** The AVB consists of a float check, a check seat, and an air-inlet port. A shutoff valve immediately upstream may or may not be an integral part of the device. The AVB is designed to allow air to enter the downstream water line to prevent backsiphonage. This unit may never be subjected to a backpressure condition or have a downstream shutoff valve, or be installed where it will be in continuous operation for more than 12 hours.

**AUXILIARY WATER SUPPLY.** Any water supply on or available to the premises other than WSSC's approved public potable water supply. These auxiliary waters may include water from another water purveyor's public potable water supply or any natural source(s), such as a well, lake, spring, river, stream, harbor, and so forth; or used waters, reclaimed waters, recycled waters, or industrial fluids. These waters constitute an unacceptable water source over which WSSC does not have sanitary control.

**AWWA.** American Water Works Association.

**BACKFLOW.** The undesirable reversal of flow of a liquid, gas, or other substances in a potable water distribution piping system as a result of a cross-connection.

**BACKFLOW PREVENTER (BFP).** An assembly, device, or method that prohibits the backflow of water or other substances into potable water supply systems.

**BACKPRESSURE.** A pressure, higher than the supply pressure, caused by a pump, elevated tank, boiler, air/steam pressure, or any other means, which may cause backflow.

**BACKSIPHONAGE.** A type of backflow where the upstream pressure to a piping system is reduced to a sub atmospheric pressure.

**CONTAINMENT.** The appropriate type or method of backflow protection at the beginning of the service connection or immediately inside the building, commensurate with the degree of hazard of the property owner's potable water system.

**CONTAMINATION.** Impairment of the quality of the water which creates an actual hazard to the public health and safety.

**CRITICAL FACILITIES.** Facilities typically having multiple water services off multiple mains to ensure continuity of service, such as hospitals, schools, certain federal facilities, and other facilities deemed critical by the required use.

**CROSS-CONNECTION.** A connection or a potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, water products, steam, water from other sources (potable or non-potable), or any matter that may change the color of or add odor to the water. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur are considered to be cross-connections.

**CROSS-CONNECTION CONTROL.** A program to eliminate, monitor, protect and prevent cross-connections from allowing backflow.

**CROSS-CONNECTION TECHNICIAN.** A WSSC-licensed Master Plumber, Master Plumber/Gasfitter, Journeyman Plumber or Journeyman Plumber/Gasfitter who is licensed by WSSC for installing, servicing and testing of backflow assemblies.

**CUSTOMER.** For purposes of this Code, a member of the regulated community which may be a property or building owner, tenant, occupant, or other controlling entity over any portion of a property's water distribution system or water utilizing equipment.

**DEGREE OF HAZARD.** An actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the owner's potable water system.

**DEVICE.** A non-testable backflow preventer.



**DOUBLE CHECK DETECTOR BACKFLOW-PREVENTION ASSEMBLY (DCDA).**

A specially designed backflow assembly composed of a line-size-approved double check valve assembly with a bypass containing a specific water meter and an approved double check valve assembly. The meter shall be provided by WSSC. The meter piping shall allow the meter to be installed either horizontal or vertical. This assembly shall only be used to protect against a non-health hazard (i.e., a pollutant).

**DOUBLE CHECK VALVE ASSEMBLY (DC or DCVA).**

A complete assembly consisting of two internally loaded, independently operating check valves, located between two tightly closing resilient-seated shutoff valves with four properly placed resilient-seated test cocks. This assembly shall only be used to protect against a non-health hazard (i.e., a pollutant).

**FIELD TESTING.** A procedure to determine the operational and functioning status of a backflow preventer.

**HIGH HAZARD (health hazard).** A cross-connection or potential cross-connection involving any substance that could, if introduced into the potable water supply, cause death or illness, spread disease, or have a high probability of causing such effects.

**HOUSE LINE.** An industry term used to describe the gas piping system downstream of the point of delivery (Gas Meter).

**INTERNAL PROTECTION.** Fixture isolation and/or isolation of an area or zone. Protection at the fixture means installing an approved backflow preventer at the source of the potential hazard within a specific area.

**ISOLATION.** Assemblies or devices installed to protect against backflow at individual cross connections.

**LOW HAZARD (non-health hazard).** A cross-connection or potential cross-connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable if introduced into the potable water supply.

**PRESSURE VACUUM-BREAKER ASSEMBLY (PVB).** An assembly consisting of an independently operating, internally loaded check valve, an independently operating, loaded air-inlet valve located on the discharge side of the check valve, with properly located resilient-seated test cocks and tightly closing resilient-seated shutoff valves attached at each end of the assembly designed to be operated under pressure for prolonged periods of time to prevent backsiphonage. The pressure vacuum breaker may not be subjected to any backpressure. This assembly may be used to protect against a non-health hazard (i.e., a pollutant) or a health hazard (i.e., a contaminant).

**REDUCED-PRESSURE PRINCIPLE BACKFLOW-PREVENTION ASSEMBLY (RPBA or RPZA).**

A complete assembly consisting of a mechanical, independently acting, hydraulically dependent relief valve, located between two independently operating, internally

loaded check valves that are located between two tightly closing resilient-seated shutoff valves with four properly placed resilient-seated test cocks. This assembly may be used to protect against a non-health hazard (i.e., a pollutant) or a health hazard (i.e., a contaminant).

**REDUCED-PRESSURE PRINCIPLE DETECTOR BACKFLOW-PREVENTION ASSEMBLY (RPDA).** A specially designed backflow assembly composed of a line-size proved reduced-pressure principle backflow-prevention assembly with a bypass containing a specific water meter and an approved reduced-pressure principle backflow-prevention assembly. The meter shall be provided by WSSC. The meter piping shall allow the meter to be installed either horizontal or vertical. This assembly may be used to protect against a non-health hazard (i.e., a pollutant) or a health hazard (i.e., a contaminant).

**SPILL-RESISTANT PRESSURE VACUUM-BREAKER BACKSIPHONAGE-PREVENTION ASSEMBLY (SVB):** A backflow assembly containing an independently operating, internally loaded check valve and independently operating loaded air-inlet valve located on the discharge side of the check valve. The assembly is to be equipped with a properly located resilient-seated test cock, a properly located bleed/vent valve, and tightly closing resilient-seated shutoff valves attached at each end of the assembly. This assembly is designed to protect against a non-health hazard (i.e., a pollutant) or a health hazard (i.e., a contaminant) under backsiphonage condition only.

### **302.6 Amendment of IPC CHAPTER 6, WATER SUPPLY AND DISTRIBUTION**

**302.6.1 IPC Section 604, Design of Building Water Distribution System,** is hereby **AMENDED** by **MODIFYING** Section 604.1, to describe, and provide details for, the alternate means of sizing water distribution systems.

(IPC as amended)

**604.1 General.** The design of the water distribution system shall conform to accepted engineering practice. Methods utilized to determine pipe sizes shall **meet one of the specified methods below:**

**604.1.1 IPC Appendix E, Section E103.3 Segment Loss Method.** Professional designs shall be validated and approved by the Plans Review office.

**604.1.2 IPC Appendix E, Section E201 Size of water-service mains, branch mains and risers.**

**604.1.2.1 Water Service Connections (WSSC main to property line) for Group R-3 occupancies shall be sized per 604.1.3 below.**

**604.1.2.2 Table E201.1 "Meter and Service Pipe" column is used to determine size of water service (on-property only); disregard meter size whether inside or outside. Use developed length from property line to service valve.**

**604.1.2.3** Table E 201.1 "Distribution Pipe" column is use to determine size of distribution main (service valve to first major branch, riser, or water heater supply). Use developed length from service valve to most remote fixture.

**604.1.2.4** For all other segments, use developed length from distribution main to most remote fixture served through that segment.

**604.1.3 Existing Service Connection Size Validation for Renovation or Additions to; or Replacement of; or New Group R-3 Occupancies (Flush Tank type toilets only):**

**604.1.3.1** The following considerations shall only apply to domestic fixture demand sizing. Adequacy of an existing service connection to serve a fire sprinkler system shall be determined by the appropriate county or city fire protection review agency.

**604.1.3.2** The following considerations provide only a minimum standard of service; are to be considered as an alternative to expensive street excavation; and are not meant to serve a dwelling with moderate to heavy occupancy and/or fixture use.

**604.1.3.3** A 3/4" service connection is limited to 25 wsfu as determined by Table E103.3(2).

**604.1.3.4** A 1" service connection is limited to 50 wsfu as determined by Table E103.3(2).

**604.1.3.5** The homeowner shall sign and submit an acceptance letter when existing 3/4" and 1" service connections will serve additional fixtures, or new or replaced houses.

**604.1.4 Engineered Designs.** Plans Review validation and approval required.

**302.10.1 IPC Section 1003, Traps, Interceptors, and Separators:**

**1003.5.2.1** Flow-based grease interceptors shall be installed below grade, direct buried, where listed for such application or within a vault; or indoors within a conditioned space; or in accordance with manufacturer's requirements. Mechanical flow-based interceptors shall not be installed below grade or slab, including within a vault or manufacturer's recess/receiver box. Mechanical flow-based interceptors may be partially recessed in a manner that allows all electronic components to remain one (1) inch above finished floor.

**1003.5.2.3** Upon removal of the interceptors main access cover(s), the inlet and outlet chambers/baffles shall be unobstructed for visible inspection and not require the removal of internal obstructions such as plugs, caps, panels, etc. Where visible obstructions exist, auxiliary monitoring/inspection ports shall be field installed into the inlet and/or outlet piping as needed. Monitoring/inspection ports shall meet Commission details.

**1003.5.3 Sizing:**

Table 1003.a

Flow Rates for Various Drain Tail Piece Sizes

Tail Piece Diameter	Flow Rate
1/2"	7 gpm
3/4"	12 gpm
1"	20 gpm
1-1/4"	30 gpm
1-1/2"	40 gpm
2"	65 gpm

Note: No offsets permitted in 1/2" and 3/4" tailpieces

**103.6.2.6** All volume based interceptors shall be installed at a maximum depth of twelve (12) feet; measured from the bottom of the tank to the highest manhole rim elevation. In addition, the maximum elevation difference between the tank bottom and the pavement (where the hauler will be parked during service), shall be twenty (20) feet.

**402.3 Amendment of IFGC CHAPTER 3, GENERAL REGULATIONS.**

**402.3.1 IFGC Section 310.1.1, CSST,** is hereby AMENDED by ADDING specific bonding parameters for Corrugated Stainless Steel Tubing (CSST), all to read as follows:

(IFGC as amended)

**310.1.1 CSST.** Corrugated stainless steel tubing (CSST) gas piping systems shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building or where the gas piping is closest to the electrical service grounding electrode when the gas service and electric service are in separate areas. The bonding jumper shall be not smaller than 6 AWG copper wire or equivalent.

**310.1.2 Prohibited - Additional Driven Grounds.** All gas piping systems shall be bonded only to the main electrical system's grounding system; driving a secondary ground is prohibited.

# CHAPTER 5

## CROSS CONNECTION CONTROL

### BACKFLOW PREVENTION

#### SECTION 501

##### GENERAL

**501.1 Scope.** This Chapter shall provide provisions to protect potable water distribution systems from contamination caused by unprotected or improperly protected cross connections (aka: backflow or backflow prevention). This includes the installation, alteration, repair, relocation, replacement, or maintenance of plumbing systems that use backflow preventers.

**501.2 Compilation.** This Chapter is the compilation of the 2010 WSSC Cross Connection Control Manual, the latest adopted International Plumbing Code Section 608, and related cross connection amendments previously contained in Chapter 3 of this Code.

**501.3 Definitions.** See Chapter 2 of this Code.

**501.4 Purpose.** A potable water system shall be designed, installed and maintained in such a manner so as to prevent contamination from non-potable liquids, solids, or gases being introduced into the potable supply through cross-connections or any other piping connections to the system. Backflow preventer applications shall conform to Table 5.1, except as specifically allowed or required in Section 506.

**501.5 Contamination by distribution components.** All piping, fixtures, fittings, equipment, appurtenances, accessories, filters, conditioners, heat exchangers, etc. shall be constructed of materials such that when the working surface areas of these components are in contact with potable water they shall not alter the taste, odor, color or potability of the water.

#### SECTION 502

##### APPLICABILITY

**502.1 Applicability.** This Chapter applies to all occupancies, including Group R-3 Occupancies (see definition), and their accessory structures.

**502.2 Hazard Classification.**

**502.2.1 General.** For the purposes of this Code, commercial and industrial facilities are considered to fall into three categories with respect to cross-connection hazard levels:

high hazard, moderate hazard and low hazard. WSSC assigns facilities to the hazard categories based on industry type and low-pressure vulnerability.

**502.2.2 Vulnerability.** WSSC prioritizes facilities based (first) on industry type and (second) on low-pressure vulnerability, to produce an overall prioritization. WSSC establishes industry type using North American Industry Classification System (NAICS) codes and descriptions. WSSC established low-pressure vulnerability using its computer water model and topographic data, and using its knowledge of areas prone to pressure transients.

### **502.3 Containment and Internal Protection (Isolation) .**

**502.3.1 New Facilities.** New facilities, of all hazard levels, shall have both containment and internal-protection assemblies and devices. Containment backflow preventers shall be installed on the outlet side of the water meter. New facilities, regardless of hazard levels, shall not have separate service lines for fire and domestic use; building water services shall be sized for a combination of fire and domestic water usage. Fire sprinkler supply may branch off in parallel to the building containment assembly and each branch shall be outfitted with the appropriate level of backflow prevention.

**502.3.2 Existing Facilities.** Containment and internal-protection assemblies in facilities built before May 1, 2007 shall remain in service, be tested annually and repaired or replaced as otherwise needed to ensure compliance with this manual. Devices shall be replaced or rebuilt every five years.

**502.3.3 Retrofitting.** Facilities built before May 1, 2007 without containment backflow preventers may not need to be retrofitted, unless otherwise deemed warranted by WSSC. WSSC shall require a containment backflow assembly if high-hazard application(s) are present. Where a facility has a containment backflow preventer not commensurate with the degree of hazard, an upgrade will be required. These facilities shall be reclassified as moderate or high hazard facilities and future inspection frequency shall be adjusted accordingly.

**502.3.4 Containment Protection of Federal Property.** *Containment* backflow protection is required for federal properties proximate to each water service connection. RPZA-type protection shall be installed above grade and protected from freezing and other physical damage per Section 507.6.2. Backflow test reports shall be submitted electronically consistent with the Commission's submittal requirements.

**502.3.5 Isolation Protection on Federal Property.** Pursuant to federal regulations, federal properties *are not required* to submit backflow test reports for *isolation* type backflow prevention assemblies installed throughout the campus. Each campus shall maintain an effective backflow program in accordance with federal standards. Program managers may voluntarily submit backflow test reports to the Commission; in doing so, reports shall be submitted electronically consistent with the Commission's submittal requirements.

## **SECTION 503 CUSTOMER'S RESPONSIBILITIES**

**503.1 Backflow Notification.** The customer shall immediately notify WSSC if there is reason to believe that backflow has or may have occurred. This shall include private water system, plumbing fixture, equipment utilizing water, or any building system with the means of contaminating the public water system or building's potable water distribution system.

**503.2 Testing and Maintenance of Backflow Preventers.** The customer, at their own expense, shall purchase, install, operate, test and maintain approved backflow-preventers as directed by WSSC. The customer shall immediately correct any malfunction of a backflow preventer revealed by periodic testing or observation. Backflow assemblies shall be tested annually or as otherwise directed by WSSC. Non-testable devices shall be replaced or re-built every 5 years.

**503.3 Licensed Cross-Connection Technician.** The customer shall be responsible for hiring a cross-connection technician (who is employed by a registered and insured Master Plumber), to perform the installation, testing and maintenance on his/her backflow-prevention assemblies.

**503.4 Elimination of Cross-Connections.** The customer shall be responsible for the elimination of, or protection against, cross-connections on their premises.

**503.5 Record Keeping.** The customer shall be responsible for maintaining all necessary records on backflow-prevention assemblies and/or devices installed on their premises.

**503.6 Change of Use.** The customer shall immediately contact WSSC when the use of his/her property changes. WSSC shall then reassess the hazard classification of the property and determine if an inspection is warranted.

**503.7 Backflow Preventers Out of Service.** The customer shall notify WSSC in writing of any backflow preventers that have been taken out of service.

## **SECTION 504 CROSS-CONNECTION CONTROL TECHNICIAN'S RESPONSIBILITIES**

**504.1 Violations.** Cross-Connection Technicians shall be held responsible for the violation of any part of this Manual whether the violation is committed by themselves or by their employees or agents.

**504.2 Testing and Maintenance of Backflow Preventers.** Cross Connection Technicians shall be responsible for performing accurate field tests and for repairing, overhauling or replacing backflow preventers. It shall be the Cross-Connection Technician's responsibility

to safeguard the design, material and/or operational characteristics of an assembly during repair or maintenance unless otherwise approved by WSSC.

**504.3 Generation of Data.** Cross Connection Technicians shall be responsible for the accurate generation of data, a correct assessment of the workings of each assembly tested, and proper dissemination of the data to WSSC and to the customer.

**504.4 Test Reports.** Any work completed by a Cross Connection Technician to achieve satisfactory test results for a customer shall be documented on WSSC's standardized test reports. *All test reports must be purchased from WSSC either on-line or at the permit counter. All test reports shall be submitted to WSSC preferably on-line and must have an assigned test report number.*

**504.5 Replacement Parts.** Cross Connection Technicians shall be responsible for ensuring that original-manufacturer replacement parts are used in the repair of or replacement of parts in a backflow-prevention assembly.

**504.6 Safety Procedures.** Cross Connection Technicians shall conduct testing upon assurance that all safety procedures have been observed and that all personnel involved have been appropriately notified.

**504.7 Cross Connection Technician's Certification.** A Cross Connection Technician's certification shall be kept current by completing recertification on or before the date the current certification expires. Any lapses in certification or discontinuance of certification shall be reported to WSSC. See §801.3.

## **SECTION 505 SELECTION OF BACKFLOW PREVENTERS**

**505.1 Approved Standards.** Backflow preventers shall conform to ASSE standards as listed in this Code, or shall be equivalent to:

- ✓ ANSI/AWWA Standards
- ✓ USC Standards
- ✓ CAN/CSA Standards

**505.2 Other Standards.** Backflow preventers manufactured to other standards may also be installed, provided written approval is first obtained from WSSC. *All equipment connected to the potable water supply system used to retract human or animal body fluids shall be protected by an air gap or a reduced pressure principle backflow assembly.*

**505.3 Application of Backflow Preventers.** Application of backflow preventers including, but not limited to, those listed in Table 5.1 shall be subject to field verification of hazards and conditions by WSSC.



**Table 5.1 Application of Backflow Preventers**

Standard Number	Backflow Preventer or Method	Type of Protection BS=back-siphonage BP=back-pressure	Degree of Hazard	Installation Dimensions and Position	Pressure Condition I=Intermittent C=Continuous	Comments	Use
ANSI A112.2.1	Air Gap	BS & BP	High	Twice effective opening—not less than 1 inch above flood level	C	See by-pass arrangements	Lavatory, Sink, or Bathtub Spouts. Pot Fillers Residential Dishwasher (ASSE 1006) and Clothes Washer (ASSE 1007) Residential Type Refrigerator/Ice Maker
ASSE 1001	Pipe Applied Vacuum Breaker	BS	High	6 inches above highest outlet Vertical position only No down stream valves	I	Outside of Fume Hood or Similar Environments	Goosenecks and appliances not subject to back pressure or continuous pressure
ASSE 1011	Hose Connection Vacuum Breaker	BS	High	Locked on hose bibb threads	I	Yard hydrant supply requires auxiliary or additional protection	Hose Bibb, Wall Hydrant and Sill cock
ASSE 1012	Dual Check Valve with Atmospheric Vent	BS & BP	Low to Moderate	Any accessible position Drain piped to floor or by air gap over a receptor (Horizontal only )	C	Drain/vent outlet shall be between 3 & 9 o'clock *See footnote	Residential Boiler, Spas, Hot Tubs, Residential Water Treatment System, Heat Transfer Fluid Make-up to a Single Wall Heat Exchanger utilizing only Non-Toxic Heat Transfer Fluid
ASSE 1013	Reduced Pressure Principle Backflow Preventer	BS & BP	High	Inside building-18 inches to 48 inches (centerline to floor) 60 inches for 2 inch or less Outside building-18 inches to 24 inches (centerline to grade) Horizontal or Vertical Drain piped to air gap over a receptor Area Shall Be Suitable for Un-controlled Discharge For Residential - Outdoors Only	C	-Valves per section 603 **See footnote Recommend floor drainage system capable of handling a catastrophic failure of the BFP	Chemical or Biological Systems Chilled Water / Cooling Tower Commercial Boiler / Heat Exchanger utilizing Toxic Heat Transfer Fluid*** Commercial Swimming Pool, Spas, etc Food Injection Equipment Hospital Equipment Lawn Irrigation Dental / Medical Vacuum Systems Interconnection w/a Non-potable System Water and Wastewater Treatment Plants Fire Sprinkler with Chemical Additives Exhaust Hood / Degreaser Commercial Water Treatment System Commercial/Industrial Landry Vehicle or Train Wash System Hose Bibb(s) in Hazardous Area

**Table 5.1: Application of Backflow Preventers (continued)**

Standard Number	Backflow Preventer or Method	Type of Protection BS=back-siphonage BP=back-pressure	Degree of Hazard	Installation Dimensions and Position	Pressure Condition (I=Intermittent) (C=Continuous)	Comments	Use
ASSE 1015	Double Check Valve Assembly	BS & BP	Low	Inside building-18 inches to 48 inches (centerline to floor) 60 inches above floor for 2 inch or less Outside building-18 inches to 24 inches (centerline to floor) 24 inches above for 2 inch or less	C	-Valves per section 603 **See footnote	Fire Sprinkler w/o Chemical Additive Wash Down Rack Culinary Pressure Cooker & Industrial Food Steamer Commercial Domestic Water - Low and Moderate Containment
ASSE 1019	Vacuum Breaker Wall Hydrants	BS	High	Minimum 6 inches above grade	I		Wall Hydrant
ASSE 1020	Pressure Type Vacuum Breaker	BS	High	Minimum of 12 inches above highest outlet; Vertical only Max. 60 inches to floor/grade Area Shall Be Suitable for Un-controlled Discharge Residential - Outdoors Only	C	-Valves per section 603 **See footnote	Residential Lawn Irrigation System
ASSE 1022	Backflow Preventer for Carbonated Beverage Machine	BS & BP	Low to Moderate	Vertical or horizontal No copper pipe downstream of backflow preventer	C	*See footnote	Carbonated Beverage System or Equipment Tea/Coffee Makers/Dispenser Juice Dispenser Frozen Beverage/Makers/Dispenser

**Table 5.1: Application of Backflow Preventers (continued)**

Standard Number	Backflow Preventer or Method	Type of Protection BS=back-siphonage BP=back-pressure	Degree of Hazard	Installation Dimensions and Position	Pressure Condition (I=Intermittent) (C=Continuous)	Comments	Use
ASSE 1024	Dual Check Valve	BS & BP	Low	Any accessible position	C	*See footnote	Residential Domestic Water Containment Residential Fire Sprinkler System Outside Drinking Fountain Commercial Ice Maker Dental Operative Unit Water Filter Cartridge Humidifier Hand Held Shower Tub Spout Below Flood Rim Shower Steamer Food Steamer; Wok Range; Proofer; Eye Wash Station <b>Clothes Dryer with Steamer</b>
ASSE 1035	Laboratory Faucet Backflow Preventer	BS	High	Six (6) inches above downstream piping Area suitable for discharge	I		-Chemical faucets Hose sprays on faucets not meeting standards Miscellaneous faucet applications
ASSE 1047	Reduced Pressure Detector Assembly	BS & BP	High	Inside building -18 to 48 inches (center line to floor) Horizontal or Vertical Drain pipe to floor Area Shall Be Suitable for Un-controlled Discharge	C	**See footnote Recommend floor drainage system capable of handling a catastrophic failure of the BFP	Fire Sprinkler with Chemical Additive and where Detector Meter is needed.
ASSE 1048	Double Check Detector Assembly	BS & BP	Low	Inside building -18 to 48 Inches (centerline to floor) Horizontal or Vertical Drain pipe to floor	C	** See footnote	Fire Sprinkler w/o Chemical Additive and where Detector Meter is needed.

**Table 5.1: Application of Backflow Preventers (continued)**

Standard Number	Backflow Preventer or Method	Type of Protection BS=back-siphonage BP=back-pressure	Degree of Hazard	Installation Dimensions and Position	Pressure Condition (I=Intermittent) (C=Continuous)	Comments	Use
ASSE 1052	Dual Check Vacuum Breakers	BS & BP	High	Hose bib Dual Check Vacuum Breaker	C		-Miscellaneous hose bibb connections
ASSE 1055	Air Gap	BS	High	Minimum of 12 inches above outlet and stored concentrate	I		Janitorial Product Dispensing
ASSE 1056	Spill-resistant vacuum breaker	BS	High	Minimum of 12 inches above highest outlet; Vertical only Max. 60 inches to floor/grade	C	-Valves per section 603	-Soap dispensers -Specialty sinks -Cleaning equipment

\*A dated test tag shall be affixed to all ASSE 1012, ASSE 1022 and ASSE 1024 devices indicating:

- Installation date.
- The following statement: "FOR OPTIMUM PERFORMANCE AND SAFETY, WSSC CODE REQUIRES THAT THIS DEVICE SHALL BE REPLACED OR REBUILT EVERY FIVE (5) YEARS. ["Replace or Rebuild" Tags are available from WSSC]

\*\*A dated test tag shall be affixed to all ASSE 1013, ASSE 1015, ASSE 1020 ASSE 1047 and ASSE 1048 assemblies. ["Test" Tags are available from WSSC]

\*\*\*Double wall heat exchanger required for domestic hot water production where toxic heat transfer fluid is utilized.

## SECTION 506

### BACKFLOW PREVENTION FOR SPECIFIC FACILITIES OR USES

**506.1 Plumbing Fixtures.** The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1.

**506.2 Devices, appurtenances, appliances and apparatus.** All devices, appurtenances, appliances and apparatus intended to provide some special function, such as sterilization, distillation, processing, cooling, or storage of ice or food, and that connect to the water supply system, shall be provided with protection against backflow and contamination of the water supply system. Water pumps, filters, softeners, tanks and all other appliances and devices that handle potable water shall be protected against contamination.

**506.3 Water service piping.** Water service piping shall be protected in accordance with the International Plumbing Code Sections 603.2 and 603.2.1.

**506.4 Chemicals and other substances.** Chemicals and other substances that produce either toxic conditions, taste, odor or discoloration in a potable water system shall not be introduced into, or utilized in, such systems.

**506.5 Valves and outlets prohibited below grade.** Potable water outlets and combination stop and waste arrangements shall not be installed below grade. Freezeproof yard hydrants that drain the riser into the ground are considered a stop and waste arrangement.

**506.5.1 Exception.** Freezeproof yard hydrants that drain the riser into the ground shall be permitted to be installed, provided that the potable water supply to such hydrants is protected upstream of the hydrants in accordance with Table 5.1 and the hydrants are permanently identified as non-potable outlets by *approved* signage that reads as follows: “ Caution, Non-Potable Water. Do Not Drink.”

**506.6 Auxiliary Water Systems.** An approved backflow-prevention assembly shall be installed at the service connection to any premises where there is an auxiliary water supply or system as follows:

**506.6.1 Connections to Potable Water Systems.** For connections to potable water systems, an air-gap separation or a reduced-pressure principle backflow-prevention assembly shall be installed at the interconnection when the auxiliary water supply is or may be contaminated to a degree that it would constitute a high hazard. A double check valve assembly shall be installed at the interconnection when the auxiliary water supply is verified as municipal grade potable water treatment under a Maryland Department of the Environment permit.

**506.6.2 Private Water Supplies and Secondary Sources of Water.** For private water supplies and secondary sources of water, an air-gap separation or a reduced-pressure principle backflow-prevention assembly shall be installed at the interconnection because the private water supply and/or secondary source of water are un-regulated and may be contaminated.

**506.6.3 Used Waters and Industrial Fluids.** For used waters and industrial fluids, an air-gap separation or a reduced-pressure principle backflow-prevention assembly shall be installed where there is a high hazard.

### **506.7 Fire Hydrant Meters and Backflow Preventers for Temporary or Seasonal Use.**

**506.7.1 General.** WSSC may authorize use of a fire hydrant water meter to applicants requiring water for temporary use as follows:

**506.7.2 Small Hydrant Meter.** A WSSC small hydrant meter (3/4inches) shall include an integral hose-connected vacuum breaker (ASSE 1011).

**506.7.3 Large Hydrant Meter.** For a WSSC large hydrant meter (3 inches), the applicant shall provide a reduced pressure principle backflow assembly (ASSE 1013) suitable for high-hazard applications. The assembly must carry a satisfactory test tag current within six months. The BFP shall be located within 20 feet of the Hydrant Meter, ahead of any water take-offs, and the inlet piping/or hose shall not be concealed.

**506.7.4 Fire Hydrant's Use Restrictions.** Fire hydrant use shall be restricted to temporary or seasonal applications such as, but not limited to: Tank-truck filling, temporary water for construction sites, special events (e.g., charity walks, fairgrounds), and seasonal uses (e.g., irrigation). Fire hydrants shall not be used to circumvent the need to obtain service connections to supply water to full-time businesses, nurseries with retail and maintenance buildings, and similar applications. Such applications shall require a permanent service connection.

**506.8 Parallel Systems.** In commercial applications and in R-3 occupancies where a 13R fire sprinkler system is specified, multiple water systems may be established in parallel as follows:

**506.8.1 Fire Sprinkler Systems** – shall be the first supply branch; this branch may be ahead of an inside domestic meter providing a detector meter type BFP is used; see 502.5.2 and 502.5.4 below.

**506.8.2 Irrigation** – branch shall be downstream of an inside meter; ahead of pressure reducing station, if applicable; backflow commiserate with hazard.

**506.8.3 Domestic** – branch shall be downstream of an inside meter; containment backflow commiserate with hazard.

**506.8.4 Non-potable system** – branch shall be downstream of an inside meter; containment backflow shall be an ASSE 1013 RP.

**506.9 Automatic Residential Fire Sprinkler Systems.** On residential buildings equipped with an NFPA 13D residential fire sprinkler system, the tee feeding the residential fire sprinkler system shall be located on the *outlet side* of the meter. Potable water systems shall be protected against backflow from automatic fire sprinkler systems by a minimum of a dual check valve, ASSE 1024, CSA B64.6. Chemical additives shall be *prohibited* in residential fire sprinkler systems. *No valve* shall be installed on the tee branch supplying the fire sprinkler system.

**506.10 Automatic Commercial Fire Sprinkler Systems.** Where potable water is used to serve or supplement a fire sprinkler system, backflow prevention shall be as follows;

**506.5.1** ASSE 1015 DCVA – Metered water; no chemical additives.

**506.5.2** ASSE 1048 DCDA – Un-metered water; no chemical additives.

**506.5.3** ASSE 1013 RPZA – Metered water; with chemical additive.

**502.5.4** ASSE 1047 RPDA – Un-metered water; with chemical additive.

**506.11 Exceptions to Requirements of 506.9 and 506.10.**

**506.11.1** Where systems are installed as a portion of the water distribution system in accordance with the requirements of this Code and the IPC and are not provided with a fire department connection, isolation or the water supply system shall not be required.

**506.11.2** Isolation or the water distribution system is not required for deluge, preaction or dry pipe systems.

**506.12 Retrofits and Existing Commercial Fire Sprinkler Systems.** Existing Commercial Fire Sprinkler Systems shall be required to update/upgrade the backflow prevention as follows:

**506.12.1 Ten Head Rule.** Where more than ten sprinkler heads are added or relocated in conjunction with interior building renovations, a testable backflow assembly corresponding to 506.10 shall be installed.

**506.12.2 Single Check Valves.** Older systems (untouched or retrofitting up to ten heads), utilizing a single check valve for backflow prevention are not required to upgrade to a testable assembly provided all of the following conditions are met:

**506.12.2.1** No chemical additives are present or have ever been utilized.

**506.12.2.2** Single check valves are replaced every five years. New check valves shall be tagged with the installation date; the expiration date; and a notice identifying the requirement to replace by the expiration date.

**506.12.2.3** Where possible, a testable backflow assembly per 506.10 shall be installed.

**506.12.3 Unprotected Systems.** Unprotected systems shall be required to have a testable backflow assembly installed per 506.10.

**506.12.4 Hydraulic Consideration.** Where backflow protection is added or upgraded, the owner/applicant, their design team, and/or their installing contractor shall be required to coordinate/permit these changes with the appropriate county or local fire officials in order to ensure the changes meet hydraulic and flow requirements of the fire department. Proof of coordination/permit shall be required.

## **SECTION 507 INSTALLATION OF BACKFLOW PREVENTERS**

**507.1 Installation Dimensions.** Installation dimensions shall conform to Table 5.1. Double check detector assemblies (ASSE 1048) and reduced-pressure detector assemblies (ASSE 1047) shall be installed in accordance with [WSSC's Standard Details for Construction](#).

### **507.2 Accessibility.**

**507.2.1 General.** Backflow preventers shall have *access* for maintenance, replacement and testing. Backflow preventers shall not be installed where platforms, ladders or lifts are required for access. Backflow preventers shall be installed inside buildings in an area capable of maintaining a minimum temperature of 50 degrees Fahrenheit, except those approved for seasonal removal or replacement.

**507.2.2 Backflow Preventers Above Grade.** If a new backflow preventer must be installed higher than 5 feet above finished floor/grade, the building owner shall install an OSHA-approved permanent platform at the backflow preventer to provide access for workers. For existing backflow preventers installed higher than 5 feet above finished floor/grade, the building owner shall provide an OSHA-approved platform or scaffold for maintenance and testing; or the owner shall contract a WSSC registered Master Plumber to relocate the assembly to an approvable location.

### **507.3 Designated Area.**

**507.3.1 General.** Backflow preventers shall be installed in an area exclusively reserved for such assemblies or devices. Related appurtenances including valves, water meters, and fire pumps and sprinkler standpipes shall be permitted to share the same area, provided respective dimensional requirements can be maintained. Adequate sized floor drains are recommended for assemblies and devices with relief opening installed inside buildings. The relief port opening shall be installed with a manufacturer's air gap fitting and piped to a floor drain or receptor.

**507.3.2 Space Requirements.** A minimum of 30 inches of unobstructed space shall be provided in front of backflow assemblies or devices for maintenance and testing. A minimum of 12 inches of unobstructed space shall also be provided behind 3-inch and



larger backflow assemblies or devices. A minimum of 6” of unobstructed space shall be provided behind 2-inch and smaller assemblies or devices. A minimum of 6 feet of headroom shall be provided. An assembly or device may be installed in an alcove or under a counter provided it is within 12 inches of the opening and positioned in a serviceable manner.

**507.4 Identification of non-potable water.** In buildings where non-potable water systems are installed, the piping conveying the non-potable water shall be identified either by color marking or metal tags in accordance with Sections 507.4.1 through 507.4.3. All non-potable water outlets such as hose connections, open ended pipes, and faucets shall be identified at the point of use for each outlet with the words, “Non-potable—not safe for drinking.” The words shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and color in contrast to the background on which they are applied.

**507.4.1 Information.** Pipe identification shall include the contents of the piping system and an arrow indication the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at maximum intervals of 25 feet (7620mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable with the room or space where the piping is located.

**507.4.2 Color.** The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify reclaimed, rain and gray water distribution systems.

**507.4.3 Size.** The size of the background color field and lettering shall comply with Table 5.2.

**Table 5.2 Size of Pipe Identification**

PIPE DIAMETER (inches)	LENGTH OF BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
¾' to 1-1/4	8	0.5
1-1/2 to 2	8	0.75
2-1/2 to 6	12	1.25
8 to 10	24	2.5
Over 10	32	3.5

**507.5 Valves.**

**507.5.1 Shut-off Valves.** Shut-off valves shall be required on the inlet and outlet of reduced-pressure assemblies (ASSE 1013 and 1047), double check assemblies (ASSE 1015 and 1048) and pressure-type vacuum breaker assemblies (ASSE 1020 and 1056), and on the inlet to atmosphere-type vacuum breaker (ASSE 1001) assemblies. Valves shall be factory affixed directly to the backflow assembly body.

**507.5.2 Requirements for ASSE 1013; 1015; 1047; and 1048 Assemblies.** A fine-mesh y-strainer with drain valve may be installed per manufacture's specifications ahead of the inlet shut-off valve on ASSE 1013 assemblies. ASSE 1013 and 1047 assemblies shall not be installed in a vertical position unless approved by the manufacturer. ASSE 1013; 1015; 1047; and 1048 assemblies for fire sprinkler systems shall be installed with FM-UL rated valves or with rising stem gate valves; valves shall be indicator type and strainers shall not be installed.

**507.5.3 Full-Flow Characteristic Valves.** Full-flow characteristic valves; either ball type or resilient seated gate type shall be installed on all assemblies.

## **507.6 Other Installation Requirements.**

**507.6.1. Bypass Arrangements.** Bypass arrangements shall be permitted around backflow preventers provided equivalent protection is installed on the bypass line.

**507.6.2 Relief Port Piping.** The termination of the piping from the relief port or *air gap* fitting of a backflow preventer shall be discharged to an *approved* indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance.

**507.6.3 Backflow Preventers Installed Outside.** Backflow preventers shall be installed inside the building unless otherwise approved by WSSC. When installed outside of a commercial or industrial building, the building owner shall provide an above grade protective enclosure for the backflow preventers which shall be heated to prevent freezing and properly secured to prevent damage to the assembly or device. Outdoor enclosures for backflow prevention assemblies shall comply with ASSE 1060. Heat shall not be required if the assembly or device is removed during the winter months. Assemblies for seasonal application shall be installed with unions. Pressure vacuum breakers may be winterized in-place.

**507.6.4 Prohibited Locations.** Backflow preventers designed to vent to atmosphere and potable system drainage valves (such as stop and waste or boiler drain type), shall not be installed in pits, vaults or similar submerged areas and shall not be installed in chemical or fume hoods. BFP's shall also be protected from freezing.

**507.6.5 Common Service.** For new construction wherein a common service splits into separate fire and domestic lines inside the property, backflow-prevention assemblies or devices shall be located after the split with no assembly or device required on the common service.

**507.6.6 Pumps and other appliances.** Water pumps, filters, softeners, tanks and all other devices that handle or treat potable water shall be protected against contamination.

**507.6.7 Booster Pumps.** Booster pumps for fire protection systems, domestic water, or local system/equipment enhancement shall be installed on the downstream side of the respective backflow preventers.

**507.6.8 Reutilization prohibited.** Water utilized for the cooling of equipment or other processes shall not be returned to the potable water system. Such water shall be discharged into a drainage system through an *air gap* or shall be utilized for non-potable purposes.

**507.6.9 Reuse of piping.** Piping that has been utilized for any purpose other than conveying potable water shall not be utilized for conveying potable water.

**507.6.10 Painting of water tanks.** The interior surface of a potable water tank shall not be lined, painted, or repaired with any material that changes the taste, odor, color or potability of the water supply when the tank is placed in, or returned to, service.

## **SECTION 508 TESTING AND MAINTENANCE OF BACKFLOW PREVENTERS**

**508.1 Replacement Intervals for Non-Testable Backflow Devices.** Customers shall have non-test backflow devices replaced rebuilt or replaced every five years.

**508.2 Testing Intervals for Testable Backflow Assemblies.** Customers shall have testable backflow assemblies tested as follows:

**508.2.1** On installation

**508.2.2** At least annually

**508.2.3** After repairs

**508.2.4** After relocation or replacement

**508.2.5** On responding to a reported backflow incident

**508.3 Permits.**

**508.3.1 Rebuilding and Testing of Backflow Preventers.**

**508.3.1.1 Testable Assemblies.** Rebuilding and testing of testable backflow assemblies shall be exempt from a permit requirement but shall only be performed by a licensed cross-connection technician.

**508.3.1.2 Non-Testable Devices.** Replacing or rebuilding non-testable backflow preventers shall be exempt from a permit requirement and may be performed by a homeowner (residential only) or a licensed cross-connection technician. A notification tag must be hung on or near the device.

**508.3.2 Long-Form Permit.** A long-form permit shall be required for a new installation, or to relocate an existing, backflow assembly or a non-testable backflow device, residential or commercial.

**508.3.3 Short-Form Permit.** A short-form permit may be used for the direct replacement of backflow-prevention assemblies provided the existing location and application are consistent with the provisions of this Manual and the manufacturer's installation instructions.

**508.3.4 Special Exception, Federal Facilities.** Permitting and inspection requirements for federal facilities shall be as provided in applicable law and/or pursuant to agreement with the appropriate federal agency. Such facilities may be required to install an outside water meter setting, and to contain the property with backflow protection, at the same general location as the meter. This installation shall be above ground and must be protected from freezing.

#### **508.4 Field-test procedures and equipment.**

**508.4.1 Field-Test Procedures.** The testing procedure for backflow-prevention assemblies shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5056, CAN/CSA B64.10.

**508.4.2 Field-Test Equipment.** To ensure the ability of the test equipment to provide accurate data, the field-test equipment shall be calibrated annually and the calibration date shall be entered on the test report. There shall be a dated calibration sticker affixed to the test equipment. Only test equipment meeting the recommendation of the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research shall be accepted for WSSC's reporting requirements.

#### **508.5 Test Reports.**

**508.5.1 General.** Testing of backflow assemblies requires the submission of a completed [WSSC backflow preventer test report](#) showing a passing test result. Replaced or rebuilt non-testable backflow preventers do not require submission of a form but a notification tag must be hung on or near the device.

**508.5.2 Submission of Test Reports.** Test reports shall be completed by certified Backflow Technicians and shall be submitted preferably on WSSC's website. (<https://eservices.wsscwater.com/wps/portal/backflow>). The test report number must be entered when test reports are submitted. These numbers will be purchased by the Principal Master Plumber before submitting reports.

**508.5.3 Failed Tests.** Test reports showing a failing test result shall not be acceptable. In the event of a failed test, the backflow technician shall repair, rebuild or replace the backflow assembly until a passing test result is obtained. If property owners do not authorize repairs, water service should not be restored until the protection of the potable water supply system is reestablished and the licensed cross connection technician shall notify WSSC.

**508.5.4 License Number.** Licensed Cross Connection Technicians shall be required to provide their license number on all test reports. Submission of a test report online

will not be possible without providing a license number. Cross Connection Technicians must also provide the registered master plumbers license number.

**604.4 Remote Reader.** Provisions for a WSSC remote reader shall be provided *for all inside Commission meters* as follows:

**604.4.1 Conduit and Cable Exit.** 18 to 48 inches above grade; do not locate in a fenced or rear yard; preferred along the front wall or sides near front corners.

**604.4.2 Conduit.** Conduit shall be 1/2" minimum I.D. and shall have no fittings greater than 45 degrees; fittings may not be insert type.

**604.4.3 Conductor Cable.** Conductor cable shall be supplied by the Commission; 2 feet of excess cable shall be left at each end; multiple cables may share a conduit, proper identification is required.

**604.4.4 Penthouse Mechanical Rooms.** The conduit and cable shall be routed such that the remote reader can be located on an accessible exterior wall of the mechanical room. Where an accessible exterior wall is not available, an alternate location shall be pre-approved by the Commission's meter services department.

**604.6 Meter Test Sleeves Not Required.** Meter Test Sleeves/Piping shall not be required for any 1-1/2" meter or for any submeter located in a penthouse mechanical room. All other meter applications require test sleeves/piping according to Commission Standard Details.

**702.3.4 Electronic Submittal Required.** Design plans and other required supporting documentation shall be submitted to the WSSC consistent with the current electronic submittal and related checklist protocols.

**801.2.24 Misconduct.** Use of abusive language, threats, mischievous or criminal acts, directed toward the public while providing services, or toward a code official while performing official duties.