

**"PART XIV (PLUMBING) of LAC TITLE 51 (PUBLIC HEALTH SANITARY CODE)"**

**SECTION 609**

**PROTECTION OF POTABLE WATER SUPPLY**

**§609. Protection of Potable Water Supply**

A. Backflow and Back-Siphonage. The potable water supply including, but not limited to, the water supply system, the water service pipe, and the water distribution system shall be protected from backflow and back-siphonage in conformance with the following.

1. Backflow. The potable water supply including, but not limited to, the water supply system, the water service pipe, and the water distribution system shall be protected against backflow. Every water outlet shall be protected from backflow, preferably by having the outlet end from which the water flows spaced a distance above the flood-level rim of the receptacle into which the water flows sufficient to provide a "minimum required air gap (water distribution)" as defined in ASME A 112.1.2. Where it is not possible to provide a minimum air gap (water distribution), the water outlet shall be equipped with an accessible backflow preventer complying with §609.B of this code.

2. Back-Siphonage. Potable water supply piping, water discharge outlets, backflow prevention devices or similar equipment shall not be so located as to make possible their submergence in any contaminated or polluted liquid or substance.

B. Approval of Devices. Devices for the prevention of backflow or back-siphoning shall comply with the standards listed in Table 609 of this code below. Devices installed in a potable water supply for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices. The plumbing official (or, for containment devices, the water supplier) may inspect such devices and, if they are found to be defective, inoperative, or the wrong application for the cross connection or potential cross connection involved, shall require the repair and/or replacement thereof. Any repair or replacement of a device shall require testing as required under §609.F.9.c of this code.

<b>Table 609 Backflow Prevention Devices</b>	
<b>Materials</b>	<b>Standards</b>
Air Gap Standards	ASME A112.1.2
Backflow Preventers for Beverage Dispensing Equipment	ASSE 1022
Backflow Preventers, Double Check Valve Assembly	ASSE 1015, AWWA C510
Backflow Preventers, Laboratory Faucet	ASSE 1035
Backflow Preventers with Intermediate Atmospheric Vent	ASSE 1012
Backflow Preventers, Double Check Detector Fire Protection Backflow Prevention Assemblies	ASSE 1048
Backflow Preventers, Hose Connection	ASSE 1052
Backflow Preventers, Reduced Pressure	ASSE 1047

<b>Table 609 Backflow Prevention Devices</b>	
<b>Materials</b>	<b>Standards</b>
Detector Fire Protection Assemblies	
Backflow Preventers, Reduced Pressure Principle Assembly	ASSE 1013, AWWA C511
Field Test Procedures for Backflow Preventer Assemblies	ASSE Series 5000
Manual for the Selection, Installation, Maintenance and Field Testing of Backflow Prevention Devices	CAN/CSA-B64.10
Vacuum Breakers, Anti-Siphon, Pressure Type Assembly (Outdoor Use)	ASSE 1020
Vacuum Breakers-Atmospheric Type	ASSE 1001
Vacuum Breakers (Spill Resistant)	ASSE 1056
Vacuum Breakers, Hose Connection	ASSE 1011
Vacuum Breaker Wall Hydrants, Freeze Resistant Automatic Draining	ASSE 1019
Water Closet Anti-Siphon Fill Valves (Ballcocks)	ASSE 1002

C. Where Required. The following are certain instances wherein backflow prevention devices are required. This list shall not be construed as all instances where a backflow prevention device is required.

1. Flushometer. Flushometer valves shall be equipped with an approved vacuum breaker. The vacuum breaker shall be installed on the discharge side of the flushing valve with the critical level at least 4 inches (102 mm) above the overflow rim of the bowl. Flushometer tanks shall be provided with an approved backflow prevention device installed above the flood-level rim of the fixture.

2. Flush Tanks. Flush tanks shall be equipped with an approved ballcock. The ballcock shall be installed with the critical level of the vacuum breaker at least 1-inch (25.4 mm) above the full opening of the overflow pipe. In cases where the ballcock has no hush tube, the bottom of the water supply inlet shall be installed at least 1-inch (25.4 mm) above the full opening of the overflow pipe. A sheathed ballcock shall be installed on all gravity flush tanks in which the flush valve seat is less than 1-inch (25.4 mm) above the flood-level rim of the bowl.

3. Lawn Sprinklers and Irrigation Piping System. Lawn sprinkler systems and irrigation piping systems shall be equipped with an approved backflow preventer to protect against contamination of the potable water system. The following devices shall be acceptable.

a. Anti-siphon vacuum breakers, reduced pressure zone backflow preventers, and pressure type vacuum breakers equipped with gate or ball valves and test cocks. See §609.F of this code for acceptable types based upon the application.

b. Atmospheric type vacuum breakers shall be installed downstream of the last control valve at least 6 inches (152 mm) above the highest point of usage (i.e., 6 inches (152 mm) above all downstream piping and the highest sprinkler head).

c. All protective devices shall be installed in an accessible location to allow for inspection and maintenance and to isolate the sprinkler system from all other piping in the system.

d. Pressure type vacuum breakers shall be installed at least 12 inches (305 mm) above the highest point of usage (i.e., 12 inches (305 mm) above all downstream piping and the highest sprinkler head).

4. Fixture Valve Outlets with Hose Attachments, Hose Bibbs and Lawn Hydrants. Fixture valve outlets with hose attachments, hose bibbs, and lawn hydrants shall comply with the following.

a. Fixture valve outlets with hose attachments, hose bibbs and lawn hydrants shall be protected against backflow by an air gap (water distribution), a vacuum breaker or other approved back-siphonage backflow preventer on the discharge side of the valve. Back-siphonage backflow preventers may be installed directly on hose outlet connection threads. Vacuum breakers shall be installed at least 6 inches (152 mm) above the highest point of usage.

i. Exception. Water heater drains, boiler drains and washing machine connections shall not be required to be fitted with backflow prevention devices.

b. In areas subject to temperatures of 32°F (0°C) or below, all hose bibb vacuum breakers shall be of such design that the hydrant may be drained without removing the backflow preventer from the hydrant. Regardless of area temperature, hose bibb vacuum breakers shall be designed and installed to prevent total removal from the hose bibb after installation in accordance with the provisions of this code and the manufacturer's instructions.

5. Water Supply to Steam and Hot Water Heating Boilers, Heat Exchangers, Chilled Water Systems, etc. A backflow preventer device which will automatically vent to the atmosphere shall be installed in the water supply line to all steam and hot water space heating boilers, heat exchangers, chilled water systems and similar devices being supplied from the potable water system. Such devices shall prevent back-siphonage and backflow from the heating system into the potable supply lines should the supply pressure fall below the pressure in the heating system. Such devices shall meet the requirements of ASSE 1012 or 1013 and shall bear such identification as is required by the applicable standard. See §609.F of this code for acceptable types based upon the application.

6. Connections to automatic fire sprinkler systems shall be required to meet the minimum requirements as referenced in §609.F of this code.

7. Handheld Showers and Pull-out Spout Type Faucets. Handheld showers and pull-out spout type faucets with integral backflow protection shall comply with ASME A112.18.1, CSA B125.1, or ASME A112.18.3; or, in lieu thereof, shall require a dedicated deck or wall mounted vacuum breaker.

8. Portable Cleaning Equipment. Where the portable cleaning equipment connects to the water distribution system, the water distribution system shall be protected against backflow with an air gap (water distribution), an atmospheric type vacuum breaker, a pressure type vacuum breaker or a reduced pressure principle backflow preventer. See §609.F of this code for acceptable types based upon the application.

9. Chemical Dispensers. Where chemical dispensers connect to the water distribution system, the water distribution system shall be protected against backflow with an air gap (water distribution), an atmospheric type vacuum breaker, a pressure type vacuum breaker or a reduced pressure principle backflow preventer. See §609.F of this code for acceptable types based upon the application.

10. Dental Pump Equipment. Where dental pumping equipment connects to the water distribution system, the water distribution system shall be protected against backflow with an air gap (water distribution), an atmospheric type vacuum breaker, a pressure type vacuum breaker or a reduced pressure principle backflow preventer. See §609.F of this code for acceptable types based upon the application.

D. Backflow Preventer Installation. Backflow preventers shall be installed in accord with the following.

1. Reduced pressure zone (RPZ) type backflow preventers, and other types of backflow preventers with atmospheric ports and/or test cocks (e.g., atmospheric type vacuum breakers, double check valve assemblies, pressure type vacuum breaker assemblies, etc.), shall not be installed below grade<sub>(G)</sub> (in vaults or pits) where the potential for a relief valve, an atmospheric port, or a test cock being submerged exists.

a. RPZ type backflow preventers and other types of backflow preventers having an atmospheric discharge port (e.g., backflow preventer with intermediate atmospheric vent) shall be installed such that the lowest point of the atmospheric discharge port's opening shall be a minimum of 12 inches above grade<sub>(G)</sub> or platform. When RPZ type backflow preventers and other types of backflow preventers with an atmospheric discharge port (e.g., backflow preventer with intermediate atmospheric vent) are installed in flood-prone areas, the lowest point of the atmospheric

discharge port's opening should be installed at least 2-feet above the highest flood level which may have occurred in 10-year period, but in no case less than 2-feet above grade<sub>(G)</sub>.

b. For the purpose of maintenance, double check valve assembly type backflow preventers shall be installed a minimum of 12 inches above grade<sub>(G)</sub> or platform.

2. Pipe-applied atmospheric type vacuum breakers shall be installed not less than 6 inches (152 mm) above all downstream piping and not less than 6 inches (152 mm) above the flood-level rim of the fixture receptor or device served. Pipe-applied pressure type vacuum breakers shall be installed not less than 12 inches (305 mm) above all downstream piping and not less than 12 inches (305 mm) above the flood-level rim of the fixture receptor or device served. Approved deck-mounted vacuum breakers and vacuum breakers within equipment, machinery and fixtures, whether of the atmospheric or spill-proof pressure type, where the critical level is a fixed distance above the potential source of contamination, shall be installed not less than 1-inch (25.4 mm) above the flood-level rim of the fixture receptor device served or source of contamination.

3. Access, Clearance, and Platform. Backflow preventer assemblies shall be installed in an accessible location to provide for the required testing, maintenance and repair. A minimum of 1-foot of clearance shall be provided between the lowest portion of the assembly and grade<sub>(G)</sub> or platform. Elevated installations exceeding 5-feet above grade<sub>(G)</sub> shall be provided with a suitably located permanent platform capable of supporting the general tester, licensed plumber, or any other person authorized in accordance with §§609.F.8 and 609.F.9 of this code to test or repair the assembly.

E. Reduced Pressure Zone Backflow Preventers. Reduced pressure zone backflow applications subject to periodic no flow conditions should include a single soft seated spring loaded check valve located immediately upstream of the backflow prevention device to prevent periodic relief valve activation caused by fluctuating supply pressures.

F. Additional Requirements to Protect the Potable Water Supply [formerly Appendix D - Cross Connection Control]. The following are additional, more specific requirements for the protection of the potable water supply including, but not limited to, the water supply system, the water service pipe, and the water distribution system. For other rules and regulations regarding potable water supply protection, see Part XII (Water Supplies) of the State Sanitary Code of Louisiana (LAC 51:XII).

1. Purpose. The purpose of this Subsection is to provide for the protection of the public from the possibility of contamination or pollution by isolating such contaminants or pollutants which could backflow or back-siphon into a potable water supply; to promote the elimination or control of existing cross-connections, actual or potential, between potable water supplies and non-potable systems/sources; and to promote the maintenance of a continuing program of cross-connection control in the State of Louisiana.

2. Definitions. Definitions contained in Chapter 2 shall also apply to this Subsection except where the following special definitions shall apply.

*Air Gap (Water Distribution)*—in a *water supply system* and/or a *water distribution system*, the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, *plumbing fixture*, or other device and the *flood-level rim* of the receptacle.

*Atmospheric Vacuum Breaker*—a device which prevents *back-siphonage backflow* by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a *water supply system* and/or *water distribution system*.

*Backflow*—the flow of water or other liquids, mixtures, or substances into the distribution pipes of a potable *water supply system* and/or *water distribution system* from any source other than its intended source. See *Back-Pressure Backflow* and *Back-Siphonage Backflow*.

*Back-Pressure Backflow*—a condition which occurs when the downstream pressure is higher than the supply pressure causing a reversal of the normal direction of flow.

*Backflow Preventer*—a mechanical device which prevents *backflow* of contaminants and pollutants into a potable water supply or distribution system by means of positive check members in addition to atmospheric ports.

*Backflow Prevention Assembly*—a testable *backflow preventer* which comes assembled from the manufacturer as a complete unit having approved test cocks with shut off valves installed on both the inlet and outlet sides of the *backflow preventer*.

*Backflow Prevention Device*—a non-testable backflow preventer.

*Back-Siphonage Backflow*—a reversal of the normal direction of flow in the pipeline due to a negative pressure (vacuum) being created in the supply line with the *backflow* source subject to atmospheric pressure.

*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 supply and distribution systems to protect against *back-siphonage backflow*.

*By-Pass*—any system of piping or other arrangement whereby the water may be diverted around any part or portion of a *water supply system*, *water distribution system* or water treatment facility including, but not limited to, around an installed *backflow preventer*.

*Commercial Dishwasher*—a mechanical dishwasher that is used in other than domestic applications.

*Containment*—a method of *backflow* prevention which requires a *backflow* prevention device or method on the *water service pipe* to isolate the customer from the *water main*.

*Contamination*—the introduction into water of microorganisms, chemicals, toxic substances, wastes or wastewater that makes the water unfit for its intended use.

*Cross Connection*—any connection or arrangement by means of which contaminants of any kind can be caused to enter the potable *water supply system* or *water distribution system*.

*Degree of Hazard*—an evaluation of the potential risk to public health if the public were to be exposed to contaminated water caused by an unprotected or inadequately protected cross connection.

*Double Check Valve Assembly*—an assembly of 2 independently operating spring loaded check valves, with tightly closing shut off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

*Double Check Valve with Intermediate Atmospheric Vent*—a device having two spring loaded check valves separated by an atmospheric vent chamber.

*Dual Check Valve*—two spring loaded, independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately downstream of the water meter. Not an approved backflow prevention device.

*Fixture Isolation*—a method of backflow prevention in which a *backflow preventer* is located to correct a *cross-connection* at a fixture located within the premise itself [rather than locating a *backflow preventer* on the *water service pipe* (as is done under *containment*)].

*Hose Bibb Vacuum Breaker*—a device which is permanently attached to a hose bibb and which acts as an *atmospheric vacuum breaker*.

*Human Consumption*—the use of water by humans for drinking, cooking, bathing, showering, hand washing, dishwashing, or maintaining oral hygiene.

*Master Meter*—a water meter serving multiple residential dwelling units or multiple commercial units. Individual units may or may not be sub-metered.

*Potable Water*—water having bacteriological, physical, radiological and chemical qualities that make it safe and suitable for human consumption.

*Potable Water Supply*—a publicly owned or privately owned *water supply system* which purveys *potable water*.

*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 or checks. The device includes tightly closing shut-off valves on each side of the check valves and properly located test cocks for the testing of the check valve(s).

*Public Water System*—a particular type of *water supply system* intended to provide *potable water* to the public having at least fifteen *service connections* or regularly serving an average of at least twenty-five individuals daily at least sixty days out of the year.

*Reduced Pressure Principle Backflow Preventer*—an assembly consisting of two independently operating approved 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 relief valve.

*Service Connection*—water service pipe.

*Water Service Pipe*—the pipe from the *water main* and/or water meter, *water supply system* or other approved source of water supply, to the building or structure served.

*Water Supplier*—a *person* who owns or operates a *water supply system* including, but not limited to, a *person* who owns or operates a *public water system*.

*Water Supply System*—the system of pipes or other constructed conveyances, structures and facilities through which water is obtained, treated to make it *potable* (if necessary) and then distributed (with or without charge) for human consumption or other use.

3. Air Gaps (Water Distribution). The provision of air gaps (water distribution) shall be required for backflow prevention in any and all cases where such a measure is the most practical that can be employed. The "minimum required air gap (water distribution)" shall be in accord with ASME A 112.1.2.<sup>1</sup>

<sup>1</sup>For informational purposes only, ASME A 112.1.2 generally requires a minimum required air gap equal to two times the effective opening (or 3 times the effective opening if affected by a nearby wall). Compliance shall be strictly determined by the provisions contained within the standard itself.

4. Responsibility of Water Suppliers. As required by LAC 51:XII.344, each water supplier shall protect the water produced and distributed by its water supply system from potential contamination by ensuring compliance with the containment practices and maintenance/field testing requirements prescribed by this Part or as otherwise directed by the state health officer.

5. Containment Practices. Backflow prevention methods or devices shall be utilized as directed by the water supplier or plumbing official to isolate specific water supply system customers from the water supply system's mains when such action is deemed necessary to protect the water supply system against potential contamination caused by backflow of water from that part of the water system owned and maintained by the customer (e.g., the piping downstream of the water meter, if provided).

a. As a minimum, the following types of backflow prevention assemblies or methods shall be installed and maintained by water supply system customers immediately downstream of the water meter (if provided) or on the water service pipe prior to any branch line or connections serving the listed customer types and categories.

**Table 609.F.6<sup>1</sup> (Fixture Isolation)**

9. Water Hauling Tanks
<b>Reduced Pressure Principle Backflow Preventers</b>
1. Commercial Boilers
2. Air Conditioning, Chilled Water Systems
3. Air Conditioning, Condenser Water Systems
4. Pot-type Chemical Feeders
5. Swimming Pools, Spas, Hot Tubs (air gap also acceptable)
6. Irrigation/Lawn Sprinkler Systems with Fertilizer Injection
7. Photo/X-ray/Film Processing Equipment
8. Single-walled Heat Exchangers which use any chemical, additive, or corrosion inhibitor, etc., in the heating or cooling medium
9. Double-walled Heat Exchangers which use any chemical, additive, or corrosion inhibitor, etc., in the heating or cooling medium and which does not have a path to atmosphere with a readily visible discharge
10. Room(s) or other sub-units of a premise or facility receiving water where access is prohibited
<b>Double Check Valve Assembly</b>
1. Food Processing Steam Kettles
2. Individual Travel Trailer Sites
3. Single-walled Heat Exchangers which do not use any chemical, additive, or corrosion inhibitor, etc., in the heating or cooling medium
4. Double-walled Heat Exchangers which do not use any chemical, additive, or corrosion inhibitor, etc., in the heating or cooling medium and which does not have a path to atmosphere with a readily visible discharge
<b>Atmospheric or Pressure Vacuum Breakers</b>
1. Laboratory and/or Medical Aspirators
2. Flushing Rim Bedpan Washers
3. Garbage Can Washers
4. Laboratory or Other Sinks with threaded or serrated nozzles
5. Flushometer Operated Fixtures

<b>Table 609.F.6<sup>1</sup> (Fixture Isolation)</b>
6. Commercial Washing Machines
7. Irrigation/Lawn Sprinkler Systems
8. Hose Bibbs
9. Commercial Dishwashers in commercial establishments
<b>Pressure Vacuum Breakers/Spill Resistant Vacuum Breakers</b>
1. Mortuary/Embalmng Aspirators
2. Irrigation/Lawn Sprinkler Systems with Separate Zones

NOTES:

1. See Tables 1307.E and 1307.F of this code for fixture isolation practices in hospital plumbing systems.

b. Other Fixture Isolation Practices - Table 609.F.6 of this code above is not inclusive of all potential contamination sources which may need fixture isolation protection. For potential contamination sources not listed in this table, backflow prevention methods or devices shall be utilized in accordance with Table B1 of CAN/CSA B64.10-1994.

c. When a potential contamination source and its associated backflow prevention method or device is not identified in Table 609.F.6 of this code above or Table B1 of CAN/CSA B64.10-1994, backflow prevention methods or devices shall be utilized as directed by the plumbing official.

d. In cases of a discrepancy regarding the particular backflow prevention device or method required, the device offering the higher level of protection shall be installed. In contested cases, the co-state plumbing official (i.e., the state health officer) shall be consulted to issue a ruling on the particular backflow prevention device or method required, if any.

7. Bypasses. All bypasses shall have the same level of backflow protection as the main water supply line.

8. Installation/Repair. Backflow preventers shall be installed and/or repaired by a State Plumbing Board of Louisiana (SPBLA)-licensed plumber who holds a SPBLA water supply protection specialist endorsement on his/her plumbing license pursuant to LSA - R.S. 37:1361 et seq. and its implementing regulations (LAC 46:LV.101 et seq.); or, for those backflow preventers located on public property or otherwise under the complete control of the water supplier (e.g., water meter and the piping upstream of the water meter, if provided), by a Backflow Prevention Assembly Repairer who meets the ASSE 5130 Professional Qualification Standard or other individuals holding a backflow prevention assembly repairer certificate from a nationally recognized backflow certification organization approved by the state health officer. Backflow preventers associated with a landscape irrigation system may be installed, tested, and repaired by a Horticulture Commission of Louisiana-licensed landscape irrigation contractor who holds a SPBLA-issued special water supply protection specialist endorsement in accord with R.S. 3:3808.P.

9. Maintenance/Field Testing. Backflow prevention assemblies and methods shall be checked and field tested by a Backflow Prevention Assembly Tester who meets ASSE 5110 Professional Qualification Standard, or other individuals holding a testing certificate from a nationally recognized backflow certification organization approved by the state health officer. Testing procedures shall be in accord with the requirements of §319.F of this code.

a. Types of Backflow Preventers to be Field Tested. The following types of backflow prevention assemblies and methods shall be checked and field tested in accordance with the frequency established in §609.F.9.c of this code:

- i. double check valve assemblies;
- ii. reduced pressure principle backflow prevention assemblies;
- iii. pressure vacuum breakers;



- iv. spill resistant vacuum breakers;
- v. air gaps (water distribution) on high hazard applications; and,
- vi. other backflow prevention devices as specified by the plumbing official or water supplier.

NOTE: It is recommended that other types of backflow prevention devices not listed here be visually checked periodically.

b. Any backflow preventer in §609.F.9.a of this code which is found defective shall be repaired by an individual meeting the qualifications specified in §609.F.8 of this code.

c. Frequency of Field Testing. The backflow prevention assemblies and methods specified in §609.F.9.a of this code shall be field tested:

- i. upon installation;
- ii. when cleaned, repaired, or overhauled;
- iii. when relocated;
- iv. annually;
- v. as required by the plumbing official; and,

vi. as required by the water supplier for assemblies or methods providing containment protection for their water supply system.

d. Owner Responsibilities. The owner of the backflow prevention assemblies shall comply with the following:

i. It shall be the duty of the owner of the backflow prevention assembly to see that these tests are made in a timely manner in accord with the frequency of field testing specified in §609.F.9.c of this code and that devices which are found defective are repaired or replaced in accordance with §609.F.9.b of this code.

ii. The owner shall notify the plumbing official, and/or water supplier in advance when the tests are to be undertaken so that the plumbing official and/or water supplier may witness the tests if so desired.

iii. Upon completion, the owner of a containment assembly or method (see §609.F.5 of this code) shall provide records of such tests, repairs, overhauls, or replacements to the water supplier. Upon completion, the owner of a fixture isolation device, assembly, or method (see §609.F.6 of this code) shall provide records of such tests, repairs, overhauls, or replacements to the plumbing official. In addition, all records shall be kept by the owner of the backflow prevention device or method for at least 5 years and, upon specific request, shall be made available to the plumbing official, water supplier, and/or the state health officer.

iv. All tests, repairs, overhauls or replacements shall be at the expense of the owner of the backflow preventer.

AUTHORITY NOTE: Promulgated in accordance with R.S. 40:4(A)(7) and R.S. 40:5(2)(3)(7)(9)(16)(17)(20).

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