APPENDIX D
CROSS CONNECTION CONTROL

(APPENDIX D IS A REQUIREMENT OF THIS CODE)

D101 The purpose of this Appendix 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.

D102 DEFINITIONS Definitions contained in Chapter 2 shall also apply to this appendix except where the following special definitions shall apply:

AIR GAP (WATER DISTRIBUTION) - in a water supply 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 by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a water system.

BACKFLOW - the flow of water or other liquids, mixtures, or substances into the distribution pipes of a potable water supply 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.

BACK-PRESSURE BACKFLOW PREVENTER - a device to prevent backflow due to a general condition in which the pressure in the system becomes greater than the supply pressure, the system being above atmospheric pressure. (See also Double Check Valve Assembly, Double Check Valve with Intermediate Atmospheric Vent, and Reduced Pressure Principle Backflow Preventer).

BACKFLOW PREVENTER - a device to prevent backflow. As there are two conditions of backflow, the device should be identified by the conditions which it is designed to prevent. (See Back-Pressure Backflow Preventer, Reduced Pressure Principle Backflow Preventer, Back-Siphonage 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.

BACK-SIPHONAGE BACKFLOW PREVENTER, GENERAL - a device or combination of devices for preventing back-siphonage backflow in a water supply line.

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 systems to protect against back-siphonage.

BY-PASS - any system of piping or other arrangement whereby the water may be diverted around any part or portion of a water supply or 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.

DEGREE OF HAZARD - the term is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water.

DOUBLE CHECK VALVE ASSEMBLY - an assembly of two (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 (2) spring loaded check valves separated by an atmospheric vent chamber.

DUAL CHECK VALVE - two (2) spring loaded, independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately down stream 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 an in-plant location rather than at a water service pipe.

HOSE BIBB VACUUM BREAKER - a device which is permanently attached to a hose bibb and which acts as an atmospheric vacuum breaker.

MASTER METER - a meter serving multiple residential dwelling 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 drinking, cooking and washing uses.

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. 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 (2) independently operating approved check valves with an automatically operating differential relief valve located between the two (2) 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 valves.

WATER SERVICE PIPE (or SERVICE CONNECTION) - 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 drinking, cooking, washing or other use.

D103 AIR GAPS The provision of air gaps 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.[1]

Note:

1. 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.

D104.1 CONTAINMENT PRACTICES. Backflow prevention methods or devices shall be utilized as directed by the 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).

D104.2 As a minimum, the following types of devices 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 D104[1]

Air Gap
1. Fire Protection/Sprinkler System utilizing non-potable water as an alternative or primary source of water
Reduced Pressure Principle Backflow Preventer
1. Hospitals, Out-Patient Surgical Facilities, Renal Dialysis Facilities, Veterinary Clinics
2. Funeral Homes, Mortuaries
3. Car Wash Systems
4. Sewage Facilities
5. Chemical or Petroleum Processing Plants
6. Animal/Poultry Feedlots or Brooding Facilities
7. Meat Processing Plants
8. Metal Plating Plants
9. Food Processing Plants, Beverage Processing Plants
10. Fire Protection/Sprinkler Systems using antifreeze in such system
11. Marinas/Docks
12. Radiator Shops
13. Commercial Pesticide/Herbicide Applicators
14. Photo/X-ray/Film Processing Laboratories
Double Check Valve Assembly
1. Fire Protection/Sprinkler Systems
2. Multiple Residential Dwelling Units served by a master meter.
3. Multistoried Office/Commercial Buildings (over 3 floors)
4. Jails, Prisons, and Other Places of Detention or Incarceration

Note:
1. Other Containment Practices - Table D104 is not inclusive of all potential contamination sources which may need containment protection. For potential contamination sources not listed in this table, backflow prevention methods or devices shall be utilized as directed by the Plumbing Official [or by the water supplier for those devices which may be associated with the water supplier's own water supply system 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)].

D105.1 FIXTURE ISOLATION PRACTICES Water supply system customers shall provide and maintain backflow prevention methods or devices as directed by the Plumbing Official within that part of the water system owned and maintained by the customer *(e.g.,* the piping downstream of the water meter, if provided, or downstream from any containment device) to protect the on-site users of the water system against potential contamination due to backflow.

D105.2 As a minimum, the following types of devices or methods shall be employed as appropriate for the following points of usage:

Table D105[1, 2]

Air Gap
1. Cooling Towers
2. Chemical Tanks
3. Commercial Dishwashers in commercial establishments
4. Ornamental Fountains
5. Swimming Pools, Spas, Hot Tubs
6. Baptismal Fonts
7. Animal Watering Troughs
8. Agricultural Chemical Mixing Tanks
9. Water Hauling Tanks
Reduced Pressure Principle Backflow Preventers
1. Commercial Boilers
2. Air Conditioning, Chilled Water Systems
3. Air Conditioning, Condenser Water Systems
4. Pot-type Chemical Feeders
5. Lawn Sprinklers with Fertilizer Injection
6. Photo/X-ray/Film Processing Equipment
Double Check Valve Assembly
1. Food Processing Steam Kettles
2. Individual Travel Trailer Sites
Atmospheric or Pressure Type Vacuum Breakers
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
6. Commercial Washing Machines
7. Lawn Sprinklers
8. Hose Bibbs
9. Commercial Dishwashers in commercial establishments

Notes:
1. See Tables G 104.6 and G 104.7 for fixture isolation practices in hospital plumbing systems.
2. Other Fixture Isolation Practices - Table D105 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 as directed by the Plumbing Official.

D106 RESPONSIBILITY OF WATER SUPPLIERS Water suppliers shall be responsible to insure the protection of the water supply system from potential contamination from certain of their customers through containment practices as prescribed by this Chapter or as otherwise directed by the State Health Officer.

D107 BYPASSES

D107.1 All bypasses shall have the same level of backflow protection as the main water supply line.

D108 MAINTENANCE/FIELD TESTING

D108.1 Types of Backflow Preventers to be Field Tested

D108.1.1 To ensure that installed backflow preventers provide continuing backflow protection, the following types of backflow preventers shall be checked and field tested in accordance with the frequency established in

D108.2 by a Backflow Prevention Assembly Tester who meets ASSE 5000 Professional Qualification Standard, or other individuals holding a testing certificate from a nationally recognized backflow certification organization approved by the Plumbing Official [or found acceptable to the water supplier for those devices which may be associated with the water supplier's own water supply system 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)]:

(a) double check valve assemblies;
(b) reduced pressure principle backflow preventers;
(c) pressure type vacuum breakers;
(d) air gaps on high hazard applications; and
(e) as otherwise specified by the Plumbing Official (or by the water supplier for those backflow preventers located on public property or otherwise under the complete control of the water supplier *(e.g.,* water meter and piping upstream of the water meter, if provided).

It is recommended that other types of backflow prevention devices be visually checked periodically.

D108.1.2 Any backflow preventer in D108.1.1 which is found defective shall be repaired by a duly authorized water supply protection specialist licensed by the Louisiana State Plumbing Board 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 ASSE 5030 Professional Qualification Standard or other individuals found acceptable to the water supplier.

D108.2 Frequency of Field Testing

The backflow prevention devices specified in D108.1.1 shall be field tested:

(a) upon installation;
(b) when cleaned, repaired, or overhauled;
(c) when relocated;
(d) annually; and
(e) as required by the Plumbing Official (or by the water supplier for those backflow preventers located on public property or otherwise under the complete control of the water supplier *(e.g.,* water meter and piping upstream of the water meter, if provided).

D108.3 Owner Responsibilities

D108.3.1 It shall be the duty of the owner of the backflow preventer to see that these tests are made in a timely manner in accord with the frequency of field testing specified in D108.2.

D108.3.2 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.

D108.3.3 All tests, repairs, overhauls or replacements shall be at the expense of the owner of the backflow preventer.

D108.3.4 All records of such tests, repairs, overhauls or replacements shall be kept by the owner of the backflow preventer for at least 5 years and, upon request, shall be made available to the Plumbing Official, water supplier, and/or the State Health Officer.