

**77 ILLINOIS ADMINISTRATIVE CODE, PART 890**  
**(NEW) ILLINOIS PLUMBING CODE (02/04)**

**SUBPART I: WATER SUPPLY AND DISTRIBUTION**

**Section 890.1110                      Quality of Water Supply**

All premises intended for human habitation or occupancy shall be provided with a potable water supply. The potable water supply shall not be connected to non-potable water and shall be protected from backflow and back siphonage.

**Section 890.1120                      Color Code**

Identification of piping. All piping conveying non-potable water shall be permanently identified by a distinctive yellow-colored paint so that such piping is readily distinguishable from piping carrying potable water. (See USAZ 253.1-1953 Safety Color Code for Marking Physical Hazards and USA AB.1-1956 Scheme for the Identification of Piping Systems.)

**Section 890.1130                      Protection of Potable Water**

- a) Cross Connection (Submergence). Potable water supply piping and water discharge outlets shall not be submerged in any sewage or toxic substance. Where potable water supply piping or water discharge outlets are submerged in other substances, they shall be provided with backflow protection as listed in Section 890.1140(f). (See Appendix I: Illustration A, B and C.)
  
- b) Approval of Devices and Maintenance. All devices and assemblies for the prevention of backflow shall comply with the standards listed in Appendix A: Table A of this Part. All reduced pressure principle (RP), reduced pressure detector (RPDA), double check (DCA) and double check detector (DCDA) backflow prevention assemblies shall be tested and approved by a Cross Connection Control Device Inspector (CCCDI) before initial operation, and at least annually thereafter. Records to verify testing and maintenance shall be available at the site of the installation.
  
- c) Backflow. The water distribution system shall be protected against backflow. Each water outlet shall be protected from backflow 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 fixed air gap. Where it is not possible to provide a minimum fixed air gap, the water outlet shall be equipped with an accessible backflow prevention device or assembly in accordance with subsection (f) or Section 890.1140.
  
- d) Fire Safety Systems. The installation of any fire safety system involving the potable water supply system shall be protected against backflow as follows:
  - 1. Backflow protection is not required for fire safety systems constructed as follows:

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- A) The system shall be looped, with no dead ends, to allow circulation, to prevent the stagnation of water in the line;
  - B) The system shall not have any non-potable connections, or a fire department hose (Siamese) connection;
  - C) The system shall have 20 sprinkler heads or less; and
  - D) The system shall be constructed of potable water supply quality pipe in accordance with Appendix A: Table A of this Part.
2. A double detector check valve or double check valve backflow preventer assembly shall be installed at the fire safety system's point of connection to the potable water supply when a fire safety system has no chemical additives or non-potable connection, but has one or more fire department hose connections (for boosting pressure and flow to the fire safety system) that are served only by fire fighting apparatus connected to a public water supply or a fire department that does not use chemical additives or rely upon any non-potable water supply.
3. A fixed air gap with a break tank or other storage vessel or a reduced pressure principle backflow preventer assembly (RPZ) shall be installed at the fire safety system's point of connection to the potable water supply when:
- A) The fire safety system contains additives such as antifreeze, fire retardant or other chemicals. (The RPZ may be located at the point of connection to that section of the system containing such additives when the system's connection to the water supply is protected by a double detector check valve backflow preventer assembly); or
  - B) Non-potable water flows into the fire safety system by gravity; or
  - C) There is a permanent or emergency connection whereby water can be pumped into the fire safety system from any other non-potable source; or
  - D) Fire department connections are available that could permit water to be pumped into the fire safety system from a non-potable source capable of serving the fire safety system. (A non-potable source of water shall be considered capable of serving the fire safety system under the following conditions: It must be capable of year-round use, maintained with at least 50,000 gallons of usable water not subject to freezing, accessible to fire fighting pumper equipment, and located within 1,700 feet of the facility.)
- e) Prohibited Connections.
- 1. Sewage Lines. There shall be no direct connection between potable water lines and lines, equipment and vessels containing sewage. Such connections shall

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be made only through a minimum fixed air gap as outlined in Section 890.1140(a).

2. Chemical or Petroleum Pressure Vessels. There shall be no direct connection between any potable water supply and any pressure vessel, i.e., storage tank, tank car, tank truck or trailer or other miscellaneous pressurized tank or cylinder containing or having contained liquified gaseous petroleum products or other liquified gaseous chemicals. Where it is necessary to discharge from a potable water line to such a vessel, such discharge shall be through a minimum fixed air gap as outlined in Section 890.1140(a). Exception: Chemical pressure vessels containing chemicals used in the water treatment process, for uses other than private purposes, are exempt from the provisions of this subsection.
  3. If water under pressure is required, as in subsections (e)(1) and (2) of this Section, it shall be supplied by means of an auxiliary pump taking suction from a tank provided for this purpose only with an overrim supply having the required minimum fixed air gap.
  4. Refrigerant Condensers. A potable water line to a single wall refrigerant condenser shall be provided with a backflow preventer complying with ASSE 1012 or 1013.
  5. No pipe or fitting of the water supply system shall be drilled or tapped nor shall any band or saddle be used except at the water main in the street. Exception: See Section 890.320(h) for potable water use only.
- f) Devices for the Protection of the Potable Water Supply. Approved backflow preventers or vacuum breakers shall be installed with all plumbing fixtures and equipment that may have a submerged potable water supply outlet and that are not protected by a minimum fixed air gap. Connection to the potable water supply system for the following fixtures or equipment shall be protected against backflow with one of the appropriate devices as indicated below:
1. Inlet to receptacles containing low hazard substances (steam, compressed air, food, beverages, etc.):
    - A) fixed air gap fitting;
    - B) reduced pressure principle backflow preventer assembly;
    - C) atmospheric vacuum breaker unit;
    - D) double check valve backflow preventer assembly;
    - E) double check backflow preventer with atmospheric vent assembly; or
    - F) dual check valve.
  2. Inlet to receptacles containing high hazard substances (vats, storage containers, plumbing fixtures, etc.)
    - A) fixed air gap fitting;
    - B) reduced pressure principle backflow preventer assembly; or
    - C) atmospheric vacuum breaker unit.
  3. Coils or jackets used as heat exchangers in compressors, degreasers, and other such equipment involving high hazard substances:

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- A) fixed air gap fitting; or
  - B) reduced pressure principle backflow preventer assembly.
4. Direct connections which are subject to back pressure:
- A) Receptacles containing low hazard substances (vats, storage containers, plumbing fixtures, etc.):
    - i) fixed air gap fitting;
    - ii) reduced pressure principle backflow preventer assembly;
    - iii) double check valve backflow preventer assembly;
    - iv) double check backflow preventer with atmospheric vent assembly;  
or
    - v) dual check valve.
  - B) Receptacles containing high hazard substances (vats, storage containers, etc.):
    - i) fixed air gap fitting; or
    - ii) a reduced pressure principle backflow preventer assembly.
5. Inlet to or direct connection with sewage or lethal substances: fixed air gap fitting.
6. Hose and spray units or stations shall be protected by one of the appropriate devices as indicated below:
- A) Fixed air gap
  - B) Reduced pressure principle backflow preventer assembly;
  - C) Double check valve backflow preventer assembly;
  - D) Double check valve backflow preventer with atmospheric vent assembly;
  - E) Dual check valve backflow preventer assembly;
  - F) Atmospheric Vacuum Breaker Unit.
- g) Installation of Devices or Assemblies.
- 1. Devices of All Types. Backflow preventer assemblies and devices shall be installed to be accessible for observation, maintenance and replacement services. Backflow preventer devices or assemblies shall not be installed where they would be subject to freezing conditions, except as allowed in Section 890.1140(d).
  - 2. All in-line backflow/back siphonage preventer assemblies shall have a full port type valve with a resilient seated shut-off valve on each side of the preventer. Relocation of the valve is not permitted.
  - 3. A protective strainer shall be located upstream of the first check valve on all backflow/back siphonage preventers unless the device contains a built-in strainer. Fire safety systems are exempt from the strainer requirement.
  - 4. Atmospheric Vacuum Breakers. Vacuum breakers shall be installed with the critical level above the flood level rim of the fixture they serve, and on the discharge side of the last control valve of the fixture. No shut-off valve or faucet shall be installed beyond the vacuum breaker.

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5. Double Check Valve, and Reduced Pressure Principle Backflow Preventer Assemblies. No in-line double check valve backflow preventer assembly (DCV) or reduced pressure principle backflow preventer assembly (RPZ) shall be located more than 5 feet above a floor, or be installed where it is subject to freezing or flooding conditions. After installation, each DCV and RPZ shall be field tested in-line in accordance with the manufacturer's instructions by a cross-connection control device inspector before initial operation. (See subsection (b) of this Section.)
6. A dual check backflow preventer with atmospheric vent assembly shall not be installed where it is subject to freezing or flooding conditions.
7. Closed water systems shall have a properly sized thermal expansion tank located in the cold water supply as near to the water heater as possible and with no shut-off valve or other device between the heater and the expansion tank. Exception: In existing buildings with a closed water system, a properly sized pressure relief valve may be substituted in place of a thermal expansion tank. For closed water systems created by backflow protection in manufactured housing, as required in Section 890.1140(i), a ballcock with a relief valve may be substituted for the thermal expansion tank.

(Source: Amended at 28 Ill. Reg. 4215, effective February 18, 2004)