

ORDINANCE NO. 426 A

ORDINANCE FOR THE CONTROL OF BACKFLOW AND CROSS CONNECTIONS

BE IT ORDAINED by the City Council of the City of Sumner, Lawrence County, Illinois, as follows:

Section 1. Authority

- 1.1 Responsibility of the Director. The Supervisor, Department of Public Works, or his designated agent, shall inspect the plumbing in every building or premises in this City as frequently as in his judgment may be necessary to ensure that such plumbing has been installed in such a manner as to prevent the possibility of pollution of the water supply of the city by the plumbing. The Supervisor shall notify or cause to be notified in writing the owner or authorized agent of the owner of any such building or premises, to correct, within a reasonable time set by the Supervisor, any plumbing installed or existing contrary to or in violation of this ordinance, and which in his judgment, may, therefore, permit the pollution of the city water supply, or otherwise adversely affect the public health.
- 1.2 Inspection. The Supervisor, or his designated agent, shall have the right of entry into any building, during reasonable hours, for the purpose of making inspection of the plumbing systems installed in such building or premises provided that with respect to the inspection of any single family dwelling, consent to such inspection shall first be obtained from a person of suitable age and discretion therein or in control thereof. Consistent refusal to allow inspection of a specific dwelling may be cause for requiring installation of suitable backflow protection or discontinuation of potable water service.

Section 2. Definitions

- 2.1 Agency. The department of the municipal government invested with the authority and responsibility for the enactment and enforcement of this ordinance.
- 2.2 Air Gap. 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 receptable.
- 2.3 Approved. Accepted by the agency as meeting an applicable specification stated or cited in this ordinance, or as suitable for the proposed use.
- 2.4 Auxiliary Supply. Any water source or system other than the potable water supply that may be available in the building or premises.
- 2.5 Backflow. The flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source. Back-siphonage is one type of backflow.
- 2.6 Backflow Preventer. A device or means to prevent backflow.
- 2.7 Back-Siphonage. Backflow resulting from negative pressures in the distributing pipes of a potable water supply.

- 2.8 Check Valve. A self-closing device which is designed to permit the flow of fluids in one direction and to close if there is a reversal of flow.
- 2.9 Contamination. See Pollution.
- 2.10 Cross Connection. Any physical connection between a potable water supply and any unapproved source or system through which backflow can occur. Furthermore, it is any potable water supply outlet which is submerged or can be submerged in waste water and/or any other source of contamination. See Backflow and Back-Siphonage.
- 2.11 Drain. Any pipe that carries waste water or waterborne wastes in a building drainage system.
- 2.12 Fixture, Plumbing. Installed receptacles, devices, or appliances supplied with water or that receive or discharge liquids or liquid-borne wastes.
- 2.13 Flood-Level Rim. The edge of the receptacle from which water overflows.
- 2.14 Hazard, Health. Any conditions, devices, or practices in the water supply system and its operation which create, or, in the judgment of the Director, may create, a danger to the health and well-being of the water consumer. An example of a health hazard is a structural defect in the water supply system, whether of location, design, or construction, that regularly or occasionally may prevent satisfactory treatment of the water supply or cause it to be polluted from extraneous sources.
- 2.15 Hazard, Plumbing. Any arrangement of plumbing including piping and fixtures whereby a cross connection is created.
- 2.16 Hydropneumatic Tank. A pressure vessel in which air pressure acts upon the surface of the water contained within the vessel, pressurizing the water distribution piping connected to the vessel.
- 2.17 Outlet. The open end of the water supply pipe through which the water is discharged into the plumbing fixture.
- 2.18 Plumbing System. Includes the water supply and distribution pipes, plumbing fixtures and traps; soil, waste, and vent pipes; building drains and building sewers, including their respective connections, devices, and appurtenances within the property lines of the premises; and water-treating or water-using equipment.
- 2.19 Pollution. The presence of any foreign substance (organic, inorganic, radiological, or biological) in water that tends to degrade its quality so as to constitute a hazard or impair the usefulness of the water.
- 2.20 Reduced Pressure Principle Backflow Preventer. An assembly of differential valves and check valves including an automatically opened spillage port to the atmosphere designed to prevent backflow.
- 2.21 Surge Tank. The receiving, nonpressure vessel forming part of the air gap separation between a potable and an auxiliary supply.

- 2.22 Vacuum. Any pressure less than that exerted by the atmosphere.
- 2.23 Vacuum Breaker, Nonpressure Type. A vacuum breaker designed so as not to be subjected to static line pressure.
- 2.24 Vacuum Breaker, Pressure Type. A vacuum breaker designed to operate under conditions of static line pressure.
- 2.25 Water, Potable. Water free from contaminants in amounts sufficient to cause disease or harmful physiological effects. Its bacteriological and chemical quality shall conform to the requirements of the Federal and State Drinking Water Regulations and to any regulations of the public health authority having local jurisdiction.
- 2.26 Water, Non-Potable. Water that is not safe for human consumption or that is of questionable potability.

Section 3. General (Technical) Requirements

- 3.1 General. A potable water supply system shall be designed, installed, and maintained in such manner as to prevent contamination from non-potable liquids, solids, or gases from being introduced into the potable water supply through cross connections or any other piping connections to the system.
- 3.2 Cross Connections Prohibited. Cross connections between potable water systems and other systems or equipment containing water or other substances of unknown or questionable quality are prohibited except when and where, as approved by the authority having jurisdiction, suitable protective devices such as the reduced pressure zone backflow preventer or equal are installed, tested, and maintained to insure proper operation on a continuing basis.
- 3.3 Interconnections. Interconnection between two or more public water supplies shall be permitted only with the approval of the state authority having jurisdiction.
- 3.4 Individual Water Supplies. Cross connections between an individual water supply and a potable public supply shall not be made unless specifically approved by the state authority having jurisdiction.
- 3.5 Connections to Boilers. Potable water connections to boilers shall be made through an air gap or provided with an approved backflow preventer.
- 3.6 Prohibited Connections to Fixtures and Equipment. Connection to the potable water supply system is prohibited unless protected against backflow in accordance with section 3.8 or as set out herein. Examples of fixtures and equipment from which the potable water supply system must be protected include:
 - (a) Bidets.
 - (b) Operating, dissection, embalming, and mortuary tables or similar equipment. In such installation the hose used for water supply shall terminate at least 12 inches away from every point of the table or attachments.

(c) Pumps for non-potable water, chemicals, or other substances. Priming connections may be made only through an air gap.

(d) Building drainage, sewer, or vent systems.

3.7 Refrigerating Unit Condensers and Cooling Jackets.

Except where potable water provided for a refrigerator condenser or cooling jacket is entirely outside the piping or tank containing a toxic refrigerant, the inlet connection shall be provided with an approved check valve. Also adjacent to and at the outlet side of the check valve, an approved pressure relief valve set to relieve at 5 psi above the maximum water pressure at the point of installation shall be provided if the refrigeration units contain more than 20 pounds of refrigerants.

3.8 Protection Against Backflow and Back-Siphonage.

3.81 Water Outlets. A potable water system shall be protected against backflow and back-siphonage by providing and maintaining at each outlet:

(a) **Air Gap.** An air gap, as specified in section 3.82, between the potable water outlet and the flood-level rim of the fixture it supplies or between the outlet and any other source of contamination, or

(b) **Backflow Preventer.** An approved device or means to prevent backflow.

3.82 Minimum Required Air Gap.

(a) **How Measured.** The minimum required air gap shall be measured vertically from the lowest end of a potable water outlet to the flood rim or line of the fixture or receptacle into which it discharges.

(b) **Size.** The minimum required air gap shall be twice the effective opening of a potable water outlet unless the outlet is a distance less than three times the effective opening away from a wall or similar vertical surface, in which cases the minimum required air gap shall be three times the effective opening of the outlet. In no case shall the minimum required air gap be less than shown in Table 3.82.

Table 3.82 Minimum air gaps for generally used plumbing fixtures

Fixture	Minimum air gap	
	When not affected by near wall ¹ (inches)	When affected by near wall ² (inches)
Lavatories and other fixtures with effective openings not greater than 1/2-in. diameter	1.0	1.50
Sink, laundry trays, goose-neck bath faucets and other fixtures with effective openings not greater than 3/4-in. diameter	1.5	2.25
Over rim bath fillers and other fixtures with effective openings not greater than 1-in. diameter	2.0	3.0
Drinking water fountains-single orifice 7/16 (0.437) in. diameter or multiple orifices having total area of 0.150 sq. in. (area of circle 7/16-in. diameter)	1.0	1.50
Effective openings greater than 1 inch	(3)	(4)

¹Side walls, ribs, or similar obstructions do not affect air gaps when spaced from inside edge of spout opening a distance greater than 3 times the diameter of the effective opening for a single wall, or a distance greater than 4 times the diameter of the effective opening for 2 intersecting walls.

²Vertical walls, ribs, or similar obstructions extending from the water surface to or above the horizontal plane of the spout opening require a greater air gap when spaced closer to the nearest inside edge of spout opening than specified in note 1 above. The effect of 3 or more such vertical walls or ribs has not been determined. In such cases, the air gap shall be measured from the top of the wall.

³2 times diameter of effective opening.

⁴3 times diameter of effective opening.

3.83 Approval of Devices. Before any device for the prevention of backflow or back-siphonage is installed, it shall have first been certified by a recognized testing laboratory acceptable to the agency Supervisor. Devices installed in a building potable water supply distribution system for protection against backflow shall be maintained in good working condition by the person or persons responsible for the maintenance of the system.

The agency Supervisor or his designee shall inspect routinely such devices and if they are found to be defective or inoperative shall require the replacement thereof.

3.84 Installation of Devices.

- (a) **Nonpressure Type Vacuum Breakers.**
Atmospheric vacuum breakers shall be installed with the critical level at least 6 inches above the flood-level rim of the fixture they serve and on the discharge side of the last control valve to the fixture. No shutoff valve or faucet shall be installed beyond the vacuum breaker. For closed equipment or vessels such as pressure sterilizers the top of the vessel shall be treated as the flood-level rim but a check valve shall be installed on the discharge side of the vacuum breaker.
- (b) **Reduced Pressure Principle Backflow Preventer.** A reduced pressure principle type backflow preventer may be installed subject to full static pressure.
- (c) **Devices of All Types.** Backflow and back-siphonage preventing devices shall be accessibly located, preferably in the same room with the fixture they serve. Installation in utility or service spaces, provided they are readily accessible, is also permitted.

3.85 Tanks and Vats - Below Rim Supply.

- (a) Where a potable water outlet terminates below the rim of a tank or vat and the tank or vat has an overflow of diameter not less than that given in Table 3.85, the overflow pipe shall be provided with an air gap as close to the tank as possible.

Table 3.85 Sizes of overflow pipes for water supply tanks

Maximum capacity of water supply line to tank	Diameter of overflow pipe (inches ID)
0-50 gpm	2
50-150 gpm	2 1/2
100-200 gpm	3
200-400 gpm	4
400-700 gpm	5
700-1,000 gpm	6
Over 1,000 gpm	8

- (b) The potable water outlet to the tank or vat shall terminate a distance not less than 1 1/2 times the height to which water can rise in the tank above the top of the overflow. This level shall be established at the maximum flow rate of the supply to the tank or vat and with all outlets except the air gap overflow outlet closed. The distance from the outlet to the high water level shall be measured from the critical point of the potable water supply outlet. Figure 3.85 illustrates this principle.

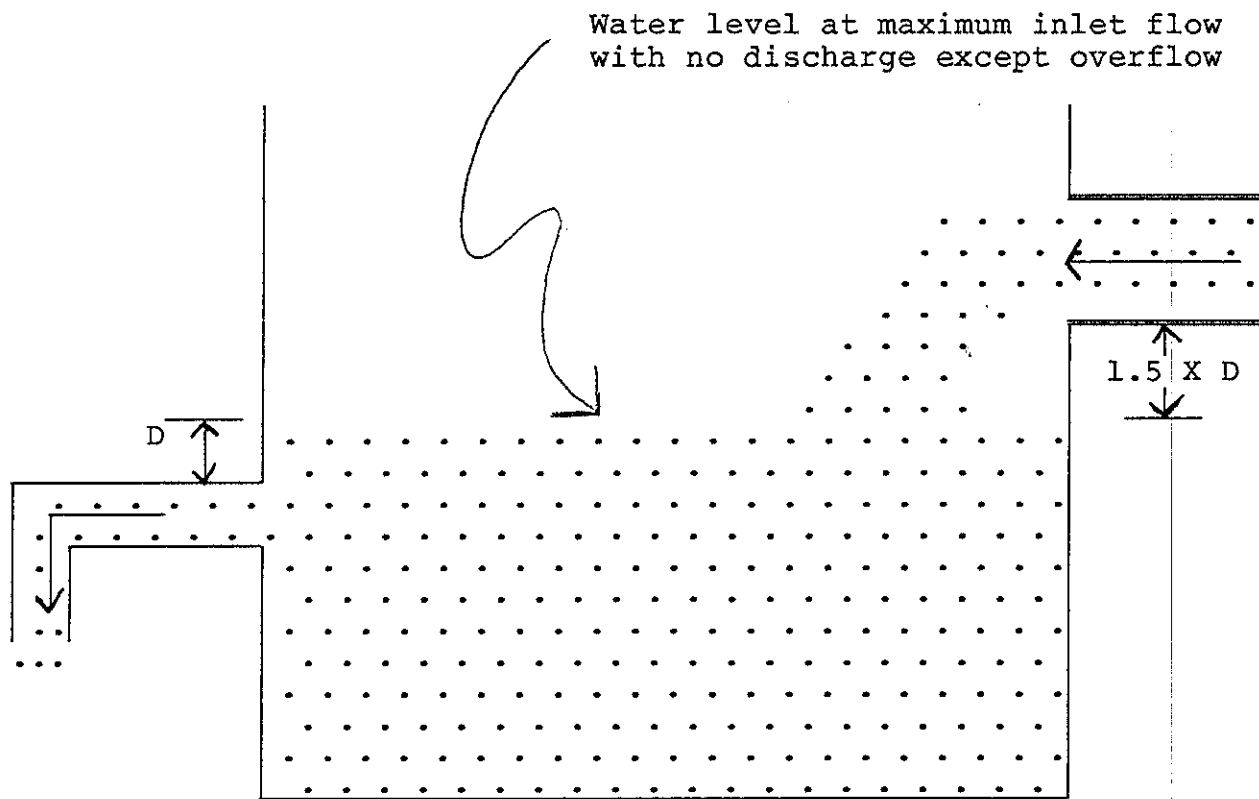


Figure 3.85 Properly protected tank with below rim supply.

3.86 Protective Devices Required. Approved devices to protect against backflow and back-siphonage shall be installed at all fixtures and equipment where backflow and/or back-siphonage may occur and where a minimum air gap cannot be provided between the water outlet to the fixture or equipment and its flood-level rim.

- (a) Connections Not Subject to Backpressure. Where a water connection is not subject to backpressure a vacuum breaker shall be installed on the discharge side of the last valve on the line serving the fixture or equipment. A list of some conditions requiring protective devices of this kind is given in the Table 3.86A.

(b) Connections Subject to Back Pressure.

Where a potable water connection is made to a line, fixture, tank, vat, pump, or other equipment with a hazard of backflow or back-siphonage where the water connection is subject to back pressure, and an air gap cannot be installed, the Supervisor will require adequate protection which may include the use of an approved reduced pressure principle backflow preventer. A partial list of such connections is shown in Table 3.86B.

Table 3.86B Partial list of cross connections which may be subject to back pressure

Chemical lines	Pumps
Dock water outlets	Steam lines
Individual water supplies	Swimming pools
Industrial process water lines	Tanks and vats - bottom inlets
Pressure tanks	Hose bibbs

- 3.87 Low Pressure Cutoff Required on Booster Pumps. When a booster pump is used on a water pressure booster system and the possibility exists that a positive pressure of less than 20 psi may occur on the suction side of the pump, there shall be installed a low pressure cutoff on the booster pump to prevent the creation of a vacuum or negative pressure on the suction side of the pump, thus cutting off water to other outlets.

Section 4. Maintenance Requirements

- 4.1 General Requirements. It shall be the responsibility of building and premise owners to maintain all backflow preventers and vacuum breakers within the building or on the premises in good working order and to make no piping or other arrangements for the purpose of bypassing backflow devices.
- 4.2 Backflow Preventers. Periodic testing and inspection schedules shall be established by the Supervisor for all backflow preventers and the interval between such testing and inspections and overhauls of each device shall be established in accordance with the age and condition of the device. Inspection intervals shall not exceed 1 year, and overhaul intervals shall not exceed 5 years. These devices should be inspected frequently after the initial installation to assure that they have been installed properly and that debris resulting from the installation has not interfered with the functioning of the device. The testing procedures shall be in accordance with the manufacturer's instructions when approved by the Supervisor.

Section 5. Violations and Penalties

- 5.1 Notification of Violation. The Supervisor shall notify the owner, or authorized agent of the owner, of the building or premises in which there is found a violation of this ordinance, of such violation. The Supervisor shall set a reasonable time for the owner to have the violation removed or corrected. Upon failure of the owner to have the defect corrected by the end of the specified time interval the Supervisor may, if in

Table 3.86A Cross connections where protective devices are required and critical level (C-L) settings for vacuum breakers^a

Fixture or equipment	Method of installation
Aspirators and ejectors	C-L at least 6 in. above flood level of receptacle served.
Dental units	On models without built-in vacuum breakers--C-L at least 6 in. above flood-level rim of bowl.
Dishwashing machines	C-L at least 6 in. above flood level of machine. Install on both hot and cold water supply lines.
Flushometers (closet & urinal)	C-L at least 6 in. above top of fixture supplied.
Garbage can cleaning machine	C-L at least 6 in. above flood level of machine. Install on both hot and cold water supply lines.
Hose outlets	C-L at least 6 in. above highest point on hose line.
Laundry machines	C-L at least 6 in. above flood level of machine. Install on both hot and cold water supply lines.
Lawn sprinklers	C-L at least 12 in. above highest sprinkler or discharge outlet. C-L at least 6 in. above flood level.
Steam tables	C-L at least 6 in. above flood-level rim or line.
Tanks and vats	C-L at least 30 in. above perforated flush pipe.
Trough urinals	Equip with approved ball cock. Where ball cocks touch tank water equip with vacuum breaker at least 1 in. above overflow outlets. Where ball cock does not touch tank water install ball cock outlet at least 1 in. above overflow outlet or provide vacuum breaker as specified above.
Flush tanks	
Hose bibbs (where aspirators or ejectors could be connected)	C-L at least 6 in. above flood level of receptacle served.

^a Critical Level (C-L) is defined as the level to which the vacuum breaker may be submerged before backflow will occur. Where the C-L is not shown on the preventer, the bottom of the device shall be taken as the C-L.


his judgment an imminent health hazard exists, cause the water service to the building or premises to be terminated, and/or recommend such additional fines or penalties to be invoked as herein may be provided.

5.2 Fines. The owner or authorized agent of the owner responsible for the maintenance of the plumbing systems in the building who knowingly permits a violation to remain uncorrected after the expiration of time set by the Supervisor shall, upon conviction thereof by the court, be required to pay a fine of not more than \$100 for each violation. Each day of failure to comply with the requirements of the ordinance, after the specified time provided under 5.1, shall constitute a separate violation.

The City Clerk is hereby directed to cause a copy hereof to be published in a newspaper of general circulation published in said City of Sumner, Lawrence County, Illinois, within 10 days from date of the passage of same.


The provisions and sections of this Ordinance shall be deemed to be separable, and the invalidity of any portion of this Ordinance shall not affect the validity of the remainder.

PASSED by the City Council of the City of Sumner, Illinois this 12 day of NOV, 1985.



Mayor of the City of Sumner,
Lawrence County, Illinois

ATTEST:



City Clerk of the City of Sumner,
Lawrence County, Illinois