**Section 890.1320 Drainage System Installation**

a) Drain – Underground. A building drainage system installed in the ground shall be of cast iron, copper Type "K", or non-metallic Schedule 40 or heavier. Drains shall be installed on a continuous bed of undisturbed earth or granular fill so as to support the pipe and fittings.

b) Existing Drain and Sewer Installation. Existing drain, waste, vent and sewer may be used in the renovation of the plumbing system of an existing structure if they are in serviceable condition and the materials comply with Appendix A.Table A (Approved Building Drainage/Vent Pipe and Approved Materials for Building Sewer).

c) Freezing. No soil or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless the piping is protected from freezing. This does not prohibit a soil or waste pipe from extending from a manufactured or mobile home unit to an approved point of discharge, provided that the waste line is protected from freezing.

d) Dead Ends. Dead ends shall be avoided in a drainage system, except where necessary to extend the system to install a cleanout in an accessible location. A dead end intended for future connection (extension) that is more than 2 feet above a floor or more than 10 feet horizontally from the nearest vented connection shall have a vented connection to the outside atmosphere. (See Appendix J.Illustration A.)

e) Horizontal Drainage Piping. Horizontal drainage piping shall be installed at a uniform grade.

f) Small Piping. Horizontal drainage piping of 3 inches diameter or less shall be installed with a grade of at least ¼-inch per foot.

g) Large Piping. Horizontal drainage piping larger than 3 inches but less than 8 inches in diameter shall be installed with a grade of at least ⅛-inch per foot. For piping 8 inches or larger in diameter, the grade is determined by the number of drainage fixture units connected to the drain pipe. (See Appendix A.Table G.)

h) Minimum Velocity. If conditions do not permit building drains to be installed with a grade as great as that specified in subsections (f) and (g), a lesser grade may be used, provided that the computed velocity will not be less than 2 feet per second.

i) Changes in Direction. Changes in direction shall be made in drainage piping by the use of 45 degree wyes, long sweeps, short sweeps, quarter, fifth, sixth, eighth, or sixteenth bends, or by a combination of these fittings. Single and double sanitary tees and short sweep quarter bends shall be used in drainage lines only where the direction of flow is from the horizontal to the vertical and may be used for making necessary vertical offsets between the ceiling and floor above. (See Appendix J.Illustrations B, C and D.) Exception: A short sweep drainage quarter bend of less than 3 inches diameter and placed in a horizontal to horizontal position for a stack vent arm may be used to receive graywater.

j) No fittings having a hub in the direction opposite to flow, or tee branch, shall be used as a drainage fitting. No running threads, bands or saddles shall be used in the drainage system. No drainage or vent pipe or fitting shall be drilled or tapped.

k) No fitting, connection, device or method of installation shall be used that obstructs or retards the flow of water, waste or air in the drainage or venting system by an amount greater than the normal frictional resistance to flow. The enlargement of a 3-inch closet bend or stub to 4 inches shall not be considered an obstruction if it is necessary to increase the bend or stub at the floor line to 4 inches in diameter to accommodate the water closet outlet.

l) Fixture Connections. Branch wastes and fittings for circuit-vented fixtures shall be installed so that the fixture drain enters the side of the branch drain. (See subsection (i) and Appendix J.Illustration E.)

m) Back-to-Back Fixtures. Back-to-back fixtures shall be installed with fittings that will prevent mixing of the discharge prior to a change in direction of flow of the discharge from each fixture, or shall be installed with fittings especially designed to eliminate throw-over or backflow of the discharge from one fixture to the other fixture.

n) Location of Drains. All building drains, branches of building drains, building sewers or any sanitary sewers shall be located at least 50 feet from a well or buried suction line, except that, when cast iron pipe with mechanical or compression joints or Schedule 40 PVC pipe with solvent weld and watertight joints is used for the building sewer, the drains shall be located at least 10 feet from a well or buried suction line.

o) Backwater valves may be installed in the building storm drain or the building drain to prevent backflow into the building, where backflow of storm water or sewage could occur. Backwater valves may be installed in the branches of the building drain that are below grade. Backwater valves, when fully opened, shall have a capacity of at least that of the pipes in which they are installed. Backwater valves shall be installed to be accessible. All backwater valves shall conform to ASME A112.14.1. All bearing parts of backwater valves shall be made of corrosion-resistant material.

(Source: Amended at 38 Ill. Reg. 9940, effective April 24, 2014)