**Section 920.40 Design Factors**

 The design of each well shall include the following:

a) Natural Protection. Location of the well shall include use of every natural protection available to promote sanitary conditions.

b) Geologic Formations. The well construction shall be adapted to the geologic formations and groundwater conditions at the site, but shall comply with this Part.

c) Undesirable Geologic Formations. Water-bearing formations shall be excluded by installing casing or a liner and properly sealing when the formations contain undesirable water. When a contaminated formation is to be excluded, the liner shall be grouted in place, in accordance with Section 920.90(h), from 10 feet below the bottom of the contaminated formation to at least 10 feet above the top of the contaminated formation. When multiple water-bearing formations of different static water levels are penetrated in the construction of a water well and the lower water-bearing formation has sufficient yield for the water well, the upper water-bearing formations shall be excluded by installing casing or a liner and properly sealing to prevent the dewatering of the upper water-bearing formations.

d) Capacity. The well shall be capable of producing as much of the desired water quantity as the aquifer or aquifers can safely furnish.

e) Durability. Construction methods and materials shall provide a durable well capable of maintaining safe water and protecting the aquifer.

f) Pitless Well Adapters. No well casing shall be cut off or cut into below ground surface except to install a pitless well adapter below the frost level. Pitless well adapters or pitless units installed on plastic well casing shall be pressurized at the point of attachment with the well casing, unless the pitless unit is solvent welded onto the plastic casing and the riser casing of the pitless unit is plastic. Pitless well adapters installed on steel well casing shall be pressurized at the point of attachment with the well casing, unless the pitless unit is threaded or welded onto the well casing. The annular opening between the well casing and the well borehole or any excavation made to install the pitless adapter shall be filled with earth to minimize settling and shall be mounded to provide drainage away from the well. The contractor installing the pitless well adaptor shall be responsible for the installation of the earth backfill. A list of approved pitless well adapters will be periodically updated and a copy of this list may be obtained from the Department.

g) Well Caps. There shall be no openings through the well cap except for a factory-installed vent, air line connection, and power supply wiring unless a proposal is submitted to and approved by the Department. The proposal shall show that any entrance into the well cap is watertight. In addition, well caps shall:

1) Prevent surface water from entering the water supply;

2) Be secured in position;

3) Be removable only with tools; and.

4) Be resistant to weathering and corrosion.

h) Chemical Injection System. Where a chemical injection system is directly connected to a water well used for irrigation, a backflow device shall be installed in accordance with Section 925.40 of the Illinois Water Well Pump Installation Code.

i) Vents. Vent piping shall be of adequate size to allow equalization of air pressure in the well. For wells that are greater than 4 inches in diameter, the vent shall be not less than ½ inch in diameter. Vent openings shall be located so as to prevent contamination of the well and shall be reasonably tamper proof. The vent opening shall be turned down, secured in position, and screened with not less than 24-mesh durable screen or filtered so as to prevent the entry of insects. The vent opening shall terminate at least 8 inches above finished grade, or 24 inches above maximum high water level in areas where flooding occurs. Wells shall be properly vented in areas where toxic or inflammable gases are known to be a characteristic of the water. If either of these types of gases are present, all vents located in buildings shall be extended to discharge outside of the building at a height where the vent will not be a hazard. Venting is required on all wells except driven water wells and flowing wells.

(Source: Amended at 37 Ill. Reg. 19676, effective November 25, 2013)