**Section 920.90 Construction Materials and Other Requirements**

a) Casing and Liner Pipe. In selection of casing and liner pipe, consideration shall be given to the stress to which the pipe will be subjected during construction and the corrosiveness of the water with which it comes in contact. Used or rejected pipe shall not be used.

1) Steel well casing shall meet one of the following standards: ASTM A53/A53M-10, ASTM 589/A589M-06, or API SPEC 5L-2011,and shall conform to Table A.

2) Plastic well casing and liners shall meet the requirements of ASTM F480-12 and the NSF/ANSI 14-2010a, Plastic Piping System Components and Related Materials. Evidence of compliance shall be inclusion in the current NSF listing and display of the NSF seal on each section of casing, and marking the casing in accordance with the requirements of ASTM Standard F-480-12.

3) Plastic well casing and liners shall be Standard Dimension Ratio (SDR) rated and conform to Table B.

b) Outer Casing. Casing intended for construction purposes only shall be of weight and design necessary to be watertight and permit installation without distortion or rupture to the specified depth and shall be removed upon completion of the well.

c) Joints. All casing and liner pipe joints shall be watertight. When the water well casing is to be extended, the joint shall be a threaded coupling or welded if the casing is metal, or the joint shall be solvent welded if the casing material is plastic. When plastic well casing is installed, the pipe spigot and socket shall be cleaned and treated with a cleaner primer. Other types of plastic joints may be evaluated and approved by the Department on the basis of NSF/ANSI 14-2010a, NSF/ANSI 61-2010a, and laboratory pressurization tests for leakage. A pressurized connection shall be used when steel casing is used to extend plastic casing when the connection is within 20 feet of the ground surface.

d) Screens. Screen openings shall provide the maximum amount of open area consistent with the strength of the screen and the grading of the water-bearing formation or gravel pack. The openings shall permit maximum transmitting ability without clogging or jamming. Screens shall be made of non-corrosive material.

e) Drive Shoe. Pipe that is to be driven shall be equipped with a drive shoe.

f) Grouting Guides. Casing that is to be pressure grouted in the drill hole or annular opening shall be provided with a centering shoe and shall have sufficient guides or centralizers to permit the unobstructed flow and deposition of the thickness of grout specified.

g) Plastic Casing Installations. There shall be no penetrations through the casing. A formation packer may be installed just above the screen on unconsolidated formation wells or just above the bottom of the casing. A coupling shall be cemented on the bottom of the casing to stabilize it in the hole. A section of steel well casing, a minimum of 5 feet in length and meeting the requirements of subsection (a)(1) may be used on the bottom of the casing in lieu of the coupling. In rock wells, the casing shall be set into the firm rock a minimum of 3 feet to prevent leaking around the end of the casing. In areas where the water is obtained at the rock surface, the casing shall be set just above the rock.

h) Grouting. Procedures and materials for grouting shall be as follows:

1) Grout Material. Grout shall be bentonite grout or neat cement grout as described in Section 920.10. The Department will maintain a list of water well grouts on its website at http://www.dph.illinois.gov/.

2) Prohibitions. Shale traps, cementing baskets, packers or other devices shall not be used to suspend grout above an open annular space. Excessive development and washing, shoveling of cuttings, or other activities shall not be used to induce collapse of the borehole wall or to reduce the amount of open annular space surrounding the permanent well casing.

3) Application. Grouting through the inside of the casing shall be performed so that the grout fills the annular opening from the bottom to the surface. If a tremie pipe is installed in the annular space, grout shall be pumped through the tremie pipe until grout completely fills the annular space to the surface. Bentonite or similar material may be added to the annular opening in the manner indicated for grouting, prior to the cement grouting, to seal any small crevices or fissures and assure that the annular space is open. If the grout settles below the ground surface or the point of pitless adapter attachment, the water well contractor who constructed the well shall grout from the depth of settling to the surface or the point of pitless adapter attachment. If the grout has settled, the annular space shall be grouted as required in this subsection (h). When the grout has settled less than 20 feet, the annular space can be grouted with bentonite chips.

4) Grouting Time. The annular space shall be grouted when the drill rig is on the drill site.

5) Setting Time. Drilling operations shall not be resumed until the cement grout has set. Neat cement grout shall set for at least 48 hours. Setting time may be reduced from 48 hours by the addition of manufacturers' approved chemicals and following manufacturers' recommendations for setting time. If the casing is fitted with a drive shoe on the bottom of the casing and driven to a firm seat into the consolidated formation, the set time can be reduced to one hour. Bentonite grout shall set for a minimum of one hour from the start of placement of the grout at the bottom of the annular opening by tremie method or one hour after completion of grouting by other methods.

i) Plumbness and Alignment. The bore of the hole shall be sufficiently plumb and straight to receive the casing without binding. The casing shall be sufficiently plumb and straight so that it will not interfere with installation and operation of the pump.

j) Construction Water. Water used in the drilling process shall be obtained from a source that will not result in contamination of the well. All of the water shall be treated so as to maintain a free chlorine residual as an extra precaution.

k) Cement Tile for Bored Wells. The minimum wall thickness shall be 2 inches. The minimum strength of the concrete shall be 4,000 pounds per square inch (psi). Before pouring the concrete, #10 gage reinforcement wire mesh with a grid size of 6 inches by 6 inches shall be installed in the concrete casing form. Other concrete tile manufacturing methods shall be approved if they are certified by the manufacturer to withstand loads at depths of 120 feet with a 2:1 load factor. Certification shall be in the form of a letter from a professional or structural engineer registered in Illinois. If the slab is buried, the top of the casing shall not be installed deeper than 30 feet below ground surface. To keep the tiles aligned during installation, the concrete tile shall be formed to have overlapping joints on the top and bottom or another equivalent means of alignment shall be used.

1) The Department will issue an approval number and a letter of certification for each approved tile and will maintain a listing of approved products.

2) Each concrete tile shall bear the manufacturer’s product approval number on the exterior of the tile.

l) Fiberglass Casing for Bored Wells. Fiberglass casing for bored wells shall meet the requirement for NSF/ANSI Standard 61 and be installed no deeper than 120 feet. The manufacturer shall certify that the fiberglass casing can withstand loads at depths of 120 feet with a 2:1 load factor. Certification shall be in the form of a letter from a professional or structural engineer registered in Illinois. If the casing is buried, the top of the casing shall not be installed deeper than 30 feet below ground surface.

m) Buried Slab for Bored Wells. The manufacturer shall certify that the buried slab shall withstand loads at depths to which it will be installed with a 2:1 load factor. Certification shall be in the form of a letter from a professional or structural engineer registered in Illinois. The design, including dimensions and type of reinforcement, shall be submitted to the Department along with the certification letter. The slab shall not be installed before Department approval is issued, based on compliance with this Section.

1) The Department will issue an approval number and a letter of certification for each approved slab and will maintain a listing of each certified precast buried slab product.

2) Each precast buried slab shall bear the manufacturer’s product approval number on the top of the precast buried slab.

3) If the buried slab is constructed of fiberglass material, it shall meet NSF/ANSI Standard 61.

n) The admission of contaminants to the borehole shall be prevented until the borehole is sealed or finished. For the purpose of this Section, materials and chemicals used to construct the well are not considered contaminants.

(Source: Amended at 46 Ill. Reg. 15751, effective August 30, 2022)