

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSTRUCTION SPECIFICATIONS**

**PUMPING PLANT (WINDMILL)**

**1. Scope**

These construction specifications cover the materials and installation of the windmill pumping plant and windmill tower.

**2. Location**

Location of the windmill pumping plant and accessories shall be as required for the well location shown on the construction plans or as staked in the field.

**3. Material**

**Windmill unit.** The windmill shall be complete (including oil) with motor, sail wheel, and tail assembly having automatic and hand-operated furl capacity. The windmill shall be self-oiling with replaceable bearings and parts. The size of the windmill shall be as specified in the design.

**Pump unit.** The pump unit shall be complete with pump rod (sucker rod or down-hole rod), drop pipe, stuffing box (when used), polished rod assembly (when used), and well cylinder assembly. A pump rod (red rod) and sanitary well seal shall also be used.

**Windmill tower.** The tower shall be a new Aeromotor, American West, Dempster, or Fiasa tower or a tower design that has been certified, signed, and stamped by an engineer licensed to practice engineering in the state of Kansas.

**Concrete pad.** A concrete pad shall be constructed from 3000-pound-per-square-inch (psi), 28-day compression strength concrete with a slump between 2 and 5 inches and reinforced with 6-inch by 6-inch by 10-gauge wire mesh or equivalent reinforcement.

**4. Installation**

**Towers.** All towers shall be installed and anchored in accordance with the manufacturer's instructions and these specifications. Components are to be compatible and function as a system. Upon completion of the installation, the fins are to be parallel to the tail and inactive.

**Setting of tower and windmill.** The tower anchor posts shall not be used as an anchor or fulcrum in lifting the windmill or tower. Extreme care shall be exercised in attaching the tower to the anchor posts. In the event the anchor posts are bent, sprung, or otherwise damaged during installation of the tower or windmill, they shall be replaced at the installer's expense.

**Alignment of tower and windmill.** Each tower and windmill shall be set in a plumbed vertical line over the centerline of the well casing. The installer shall test the plumb of the installation by hanging a plumb bob from the pump rod connection of the windmill. When the tower is in acceptable alignment, the plumb bob will fall within the well casing without touching it.

**Joints.** Threaded joints shall be properly lubricated prior to final installation.

**Pump pole (red rod).** A pump pole of sufficient length shall be installed between the windmill and the pump in accordance with the manufacturer's instructions.

**Drop pipe.** The drop pipe shall be installed to the depth specified in the design. The well cylinder barrel shall be fitted to the drop pipe prior to insertion into the well. The drop pipe shall be fitted with a final

coupling, short nipple, tee, and another short nipple--all above the well seal. The uppermost nipple shall be filled with suitable fitting to receive a stuffing box if applicable. An automatic bleeder orifice valve will be installed in the drop pipe a minimum of 3 feet below the ground surface to drain that portion of the drop pipe to prevent damage by freezing.

**Polished rod assembly.** When they are used, the polished rod, brass sleeve, and stuffing box shall be fitted and assembled in accordance with the manufacturer's instructions.

**Pump rod (sucker rod or down-hole rod).** The pump rod shall be installed to the depth specified in the design. The pump rod shall be properly fitted to the cylinder plunger and the polished rod, if applicable. Rod sections shall be straight and true and in lengths of 12 to 21 feet, except the final top section which shall be shortened to achieve the proper overall pump rod length.

**Well cylinder assembly.** The well cylinder and check shall be properly assembled and filled to the drop pipe in accordance with the manufacturer's instructions.

**Sanitary well seal.** The well seal shall be fitted securely on the well casing and adjusted to ensure a good seal and prevent pollutants from entering the well. Special attention shall be given to the installation of the seal to provide a suitable anchor for the suspension of the drop pipe.

**Concrete pad.** A 4-inch thick concrete pad shall be constructed so that it extends laterally outward from the well casing at least 2 feet in all directions. A minimum of 3 inches of sand is required below the pad. The concrete base shall be separated from the well casing by a plastic or mastic coating or sleeve, and the pad shall be sloped to drain away water from the well. The concrete shall be allowed to cure 24 hours before the tower/windmill is erected.

**Testing.** After the windmill and well equipment are installed, the installer shall use the windmill to pump a minimum of 24 hours. The installer shall check the windmill to see if the cylinder is functioning and not bottoming out and that the windmill brake and other appurtenances are functioning properly. Problems shall be corrected by the installer. If none are present at the site, the installer shall provide water storage facilities to collect the pumped water.

**Sanitary protection of well.** The installer shall protect the well during the construction period to prevent vandalism, tampering, or seepage of contaminated water, petroleum products, or other contaminants into the well from the ground surface.

## 5. Measurement

Measurement of the completed installation will be each windmill pumping plant installed. The windmill pumping plant shall be tested for proper operation.

## 6. Construction Details