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Driving a Wellpoint

A wellpoint or drive point is a pipe with wall openings large enough to allow water to enter and small enough to keep the water-bearing formation in place. Wellpoints suitable for hand driving are available in sizes from 1 1/4 to 2 inches in diameter and from 18 inches to 3 feet long. The size of openings in the wellpoint is determined by the relative grain size of the material in the water-bearing formation. Some of the finest grains adjacent to the wellpoint should be removed by pumping to make the well more productive (see figure 1). However, a wellpoint should not be expected to yield large quantities of water.

WHY WELLPOINTS ARE USED

It may be desirable to develop a water supply for sprinkling lawns, gardens, etc. An economical supply can often be obtained from a shallow aquifer (water-bearing formation) through a wellpoint. The water table should be high, preferably within 10 feet and no farther than 15 feet underground. The wellpoint must be driven deep enough to penetrate a water-bearing formation below the water table, but it should not exceed 25 feet in depth.

Shallow water tables are susceptible to pollution. Drain fields, dry wells, animal wastes, heavy fertilizer applications, etc. can contaminate a shallow water table. Recharge is usually from rainfall, falling directly above and percolating downward to the water table. As the water moves downward it may carry

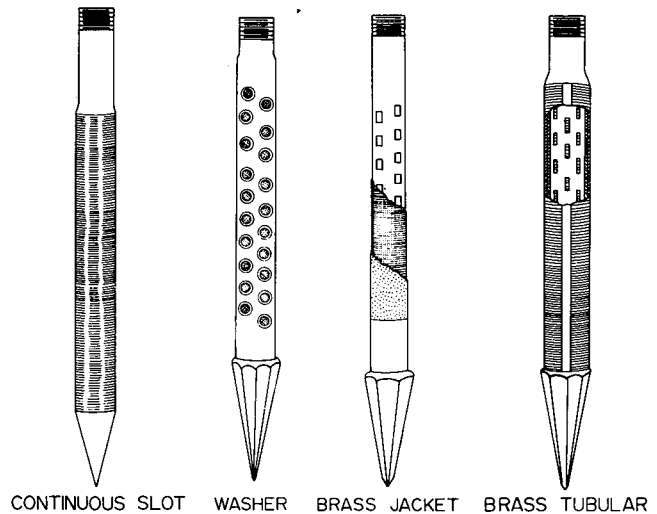


Figure 2. Types of wellpoints.

contaminants. Thus, extreme care and periodic testing are necessary if the water is used for drinking.

MATERIALS NEEDED

The following materials are needed: wellpoint, riser pipe (in 5- or 6-foot lengths, with 6-inch nipple), couplings, drive cap, and pipe thread compound.

Openings in the wellpoint should be large enough to permit the finer particles of the water-bearing formation to enter the wellpoint while keeping the coarser particles out. With proper sized openings, development of the well removes the finer particles and forms an envelope of porous and permeable material around the screen (see figure 1).

A local well contractor or hardware dealer may have valuable suggestions on the most suitable opening size for the wellpoint.

Several types of wellpoints are constructed of different materials. A few types are shown in figure 2. For mesh-covered wellpoints, the size of openings is designated by the mesh size. Common sizes, from larger to smaller openings, are 40-, 50-, 60-, 70-, and 80-mesh. For wellpoints with slot type openings, common slot sizes are 18, 12, 10, 8, and 7 slot. Slot sizes are the opening width in thousandths of an inch. No. 18 slot is 0.018-inch wide, No. 12 is 0.012-inch wide, etc.

The riser pipe should be galvanized pipe in 5- or 6-foot lengths for convenient hand driving. A standard 21-foot length of pipe cut into four pieces normally is adequate for a driven well.

Special drive pipe couplings, which allow the pipe pieces to butt together, are desirable. The impact of driving is then transmitted through the pipe and not the pipe threads. Under severe driving conditions, standard pipe couplings may cause thread cracking or failure.

The drive cap is placed on the top of the pipe section being driven. The cap transmits the blow to the pipe and protects the threads.

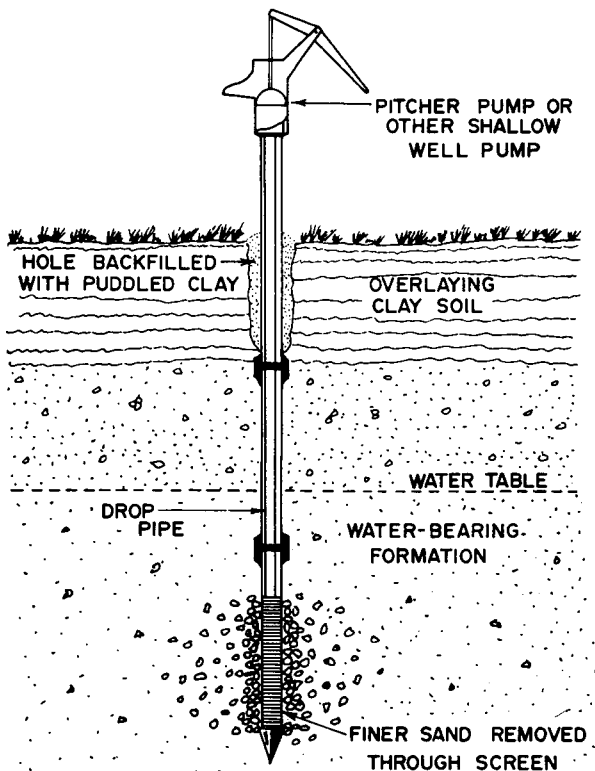


Figure 1. Installed wellpoint.

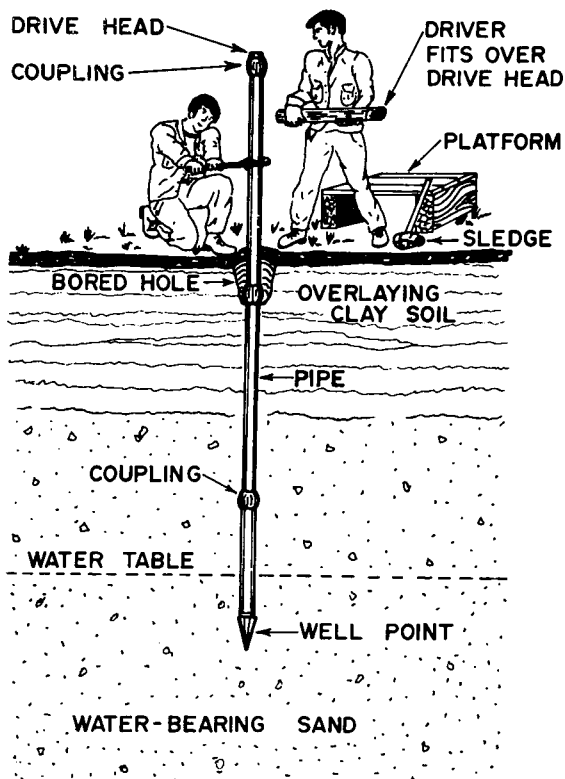


Figure 3. Driving the wellpoint.

All pipe joints should be screwed tightly after threads are carefully cleaned and oiled. White lead or pipe thread compound should be used to improve airtightness.

TOOLS NEEDED

A post hole digger or soil auger, sledge hammer, carpenter's level or plumb bob, and pipe wrenches are needed for hand-driving a wellpoint.

INSTALLATION METHOD

The well site should be at least 75 feet from sources of contamination such as a septic tank, cesspool, dry well, drain field, foundation drain, downspout, marshy area, or animal yard.

Dig or drill a vertical hole 1-2 inches larger than the wellpoint and as deep as possible with the posthole digger or auger (figure 3). The hole usually cannot be drilled more than a foot below the water table.

Rub a bar of soap over all the openings of the wellpoint to help prevent clay and sand from entering and to reduce friction during driving.

Attach a length of riser pipe to the open end of the wellpoint. Clean the threads, add the pipe thread compound to the outside threads, and make a tight connection with the pipe wrenches. Insert the wellpoint into the hole. Attach the nipple and drive cap to the top of the riser pipe. Do not use pipe thread compound on the drive cap.

Make sure that the pipe and wellpoint assembly are vertical by using the carpenter's level or the plumb bob. Use the sledge or driver to strike the drive cap with square, solid blows (figure 3).

When the drive cap is about 4 inches above the ground, unscrew the drive cap and nipple and place the unit on another section of pipe.

Clean the threads on the new section of pipe and on the pipe in the ground and add pipe thread compound to the outside threads. Tighten the joint using two pipe wrenches working in opposite directions to avoid twisting the assembly in the ground, and resume driving.

Continue the above procedure, adding sections of riser pipe as needed. To keep the threaded joints tight during driving, give the riser pipe an occasional half turn with a wrench. Use the wrench only to take up slack in the threaded joints and take care not to twist the pipe severely.

Pour water into the top of the pipe at regular intervals. This makes driving easier and will determine when a water-bearing formation is reached. When a gallon of water disappears into the formation within 2 minutes after being poured into the well, it is unnecessary to drive any deeper.

Enough of the riser pipe should extend above ground so the desired pump can be attached conveniently. For example, a hand pitcher pump should be about 3 feet above the ground. For an electric pump, the top of the riser pipe should be a foot or less above ground. The pipe may have to be cut and threaded to obtain the proper height, or it may be possible to drive the pipe to the proper height.

To prevent pumped water and other surface water from moving downward along the pipe to the water-bearing formation, backfill the drilled hole with clay soil (figure 1). The clay should be extremely wet so it will puddle or flow like heavy grease. Fill the hole somewhat higher than ground level. Cement can be poured in a base around the riser pipe. However, using cement makes it extremely difficult to pull the well at a later date.

There are several ways to clean a new well by surging and pumping. One simple method is to take a wooden rod or closed-end pipe and—simulating piston action—rapidly work it up and down for about 5 minutes just below the water level in the well. This surging effect will draw fine, loose sand and silt into the well, leaving the coarser and more permeable material outside the wellpoint. Remove the fine sand from the well with a pitcher pump or other pump capable of handling sand.

Another means of cleaning out the sand is to jet water into the well with a garden hose inserted to the bottom. The sand and silt particles will wash out around the hose. Repeat until no more sand is obtained by pumping.

Attach the pump to be used following the manufacturer's instructions. To use the well water for domestic purposes, the pump should be connected to a drop pipe installed inside the well (figure 1). A drop pipe is used so that the underground pipe in contact with the soil is not under suction. The well pipe would be under suction if the pump were connected directly to the well.

The well should be disinfected before the well water is used for drinking. For a 1 1/4- to 2-inch well, add 1 cup of 5.25 percent hypochlorite laundry bleach to 3 quarts of water and pour the solution into the well. After 12 hours, pump the well until the chlorine odor is no longer objectionable. For additional information on disinfection procedures, see Agricultural Extension Service M-156, Chlorination of Private Water Supplies.

Forty-eight hours after pumping, the water can be sampled for bacteriological examination. Write to the Minnesota Department of Health, Minneapolis 55440 for a sampling kit that includes instructions and a sterile container. The water will be tested at no charge for bacteria, nitrates, and detergents. If a shallow well is used for domestic purposes, the water should be tested annually or semi-annually.

It is usually a sound policy to have a reliable well driller develop a sanitary water supply for a home. Water purity and personal health should be the major considerations in developing a domestic water supply.