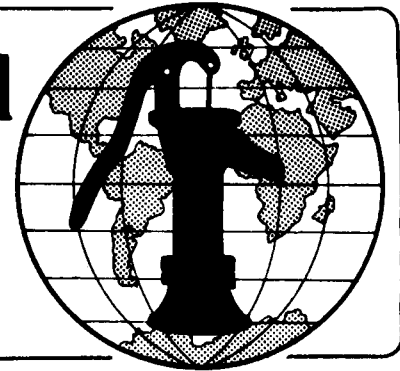


Water for the World



Designing Jetted Wells Technical Note No. RWS. 2.D.3

Designing jetted wells properly is important to ensure a year-round supply of water, and to ensure efficient use of personnel and materials. Designing involves selecting a screen, and determining all necessary personnel, materials, and equipment. The products of the design process are drawings of the well screen and a detailed materials list. These products, along with a location map similar to Figure 1 from "Selecting a Well Site," RWS.2.P.3, will be given to the construction foreman before construction begins.

This technical note describes how to design a jetted well and arrive at these two end-products. Read the entire technical note before beginning the design process.

Useful Definitions

AQUIFER - A water-saturated geologic zone that will yield water to springs and wells.

GROUND WATER - Water stored below the ground's surface.

Selecting a Screen

The well screen may be the single most important factor affecting the efficiency of a well. Screens for jetted wells are usually commercially, rather than locally, made.

Probably the best commercial screen is the continuous-slot type, which consists of a triangular-shaped wire wrapped around an array of rods. The screen offers the largest percentage of open area for ground water to enter, while retaining a small slot size to screen out particles in the aquifer. Another advantage is that the triangular-shaped openings prevent particles from sticking in the screen and clogging it during the developing process (see "Finishing Wells," RWS.2.C.8). The size of the slots can be precisely regulated and can be as small as 0.15mm.

Another commercial screen is the shutter or louver type, which is a metal tube with slots stamped out with a metal die. The disadvantages compared to a continuous-slot type are a smaller percentage of open area, a limited number of slot sizes, and a tendency for the screen to clog during the development process if the aquifer contains fine sand.

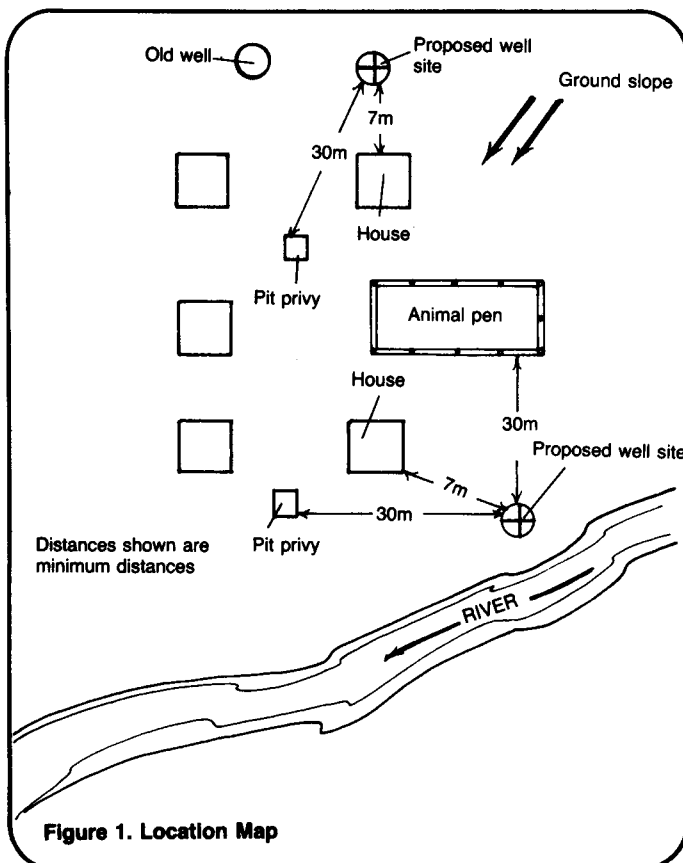
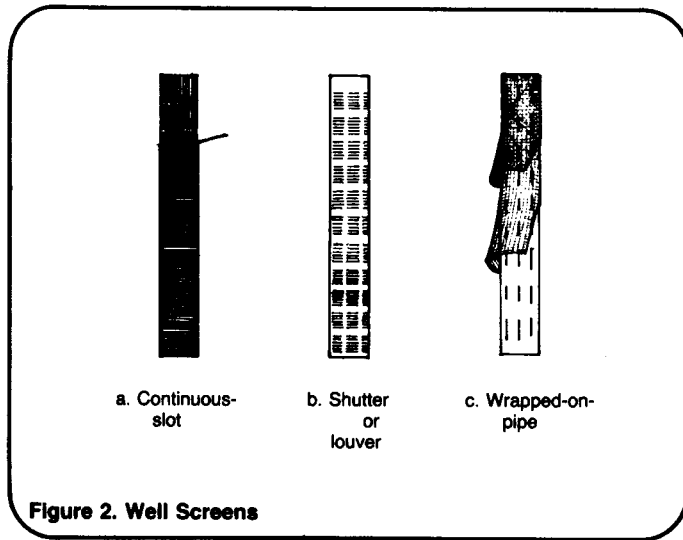


Figure 1. Location Map

A wrapped-on-pipe screen is a perforated pipe wrapped by one or more screens. It has the same disadvantages as the shutter type screen.

When the screen has been selected, prepare a drawing similar to Figure 2a, 2b, or 2c, and give it to the construction foreman.



Determining Personnel, Materials, and Equipment

A foreman is needed to oversee the well construction and one or two workers are needed to operate the jetting equipment. If a manual pump, rather than a mechanical pump is used, an additional worker may be needed to operate it.

Materials needed include a well screen and casing material. Concrete mix will be needed to line the top 3m of the well shaft.

Equipment needed includes a tripod, rope, pulley, hollow drill pipe, jetting bit, pump, flexible hose, swivel joint, pipe couplings, pipe wrenches, crescent wrenches, screwdrivers, pipe cutter, and a shovel.

When all personnel, materials, and equipment have been determined, prepare a materials list similar to Table 1 and give it to the construction foreman.

To summarize, give the construction foreman a drawing of the well screen, a detailed materials list, and a location map (from "Selecting a Well Site," RWS.2.P.3).

Table 1. Sample Materials List for a Jetted Well

| Item | Description | Quantity | Estimated Cost |
|------------------------|----------------------------------|----------|----------------|
| Personnel | Foreman | 1 | --- |
| | Workers | 3 | --- |
| Supplies | Well screen (continuous-slot) | --- | --- |
| | Casing; 50mm diameter | --- | --- |
| | Plug for screen | --- | --- |
| | Concrete mix | --- | --- |
| Equipment | Tripod | --- | --- |
| | Pulley | --- | --- |
| | Rope | --- | --- |
| | Drill pipe; 38mm diameter | --- | --- |
| | Jetting drill bit | --- | --- |
| | Pump (hand-operated) | --- | --- |
| | Hose | --- | --- |
| | Swivel hose connection | --- | --- |
| | Hose connections (standard) | --- | --- |
| | Pipe couplings | --- | --- |
| | Pipe wrenches | --- | --- |
| | Crescent wrenches | --- | --- |
| | Screwdrivers | --- | --- |
| | Pipe cutter | --- | --- |
| | Shovels | --- | --- |
| | Containers (for mixing concrete) | --- | --- |
| Measuring tape | --- | --- | |
| Other | --- | --- | |
| Total Estimated Cost = | | | --- |

Technical Notes are part of a set of "Water for the World" materials produced under contract to the U.S. Agency for International Development by National Demonstration Water Project, Institute for Rural Water, and National Environmental Health Association. Artwork was done by Redwing Art Service. Technical Notes are intended to provide assistance to a broad range of people with field responsibility for village water supply and sanitation projects in the developing nations. For more detail on the purpose, organization and suggestions for use of Technical Notes, see the introductory Note in the series, titled "Using 'Water for the World' Technical Notes." Other parts of the "Water for the World" series include a comprehensive Program Manual and several Policy Perspectives. Further information on these materials may be obtained from the Development Information Center, Agency for International Development, Washington, D.C., 20523, U.S.A.