Water for the World

Operating and Maintaining Household Water Connections

Technical Note No. RWS. 4.O.5

Operation and maintenance of a water system with household connections should be done on a routine, scheduled basis. This should be accomplished as a part of the operation and maintenance activities described in "Detecting and Correcting Leaking Pipes," RWS.4.0.1, "Operating and Maintaining Mechanical Pumps," RWS.4.0.2 and "Operating and Maintaining Hand Pumps," RWS.4.0.3.

An Operation and Maintenance Program

The first step in establishing a planned operation and maintenance schedule is to obtain an as-built plan of the system similar to Figure 1. If one does not exist, then a plan should be made. Valve locations in the main lines as well as for individual connections must be known. The location, type and size of pipe is important and necessary for emergency repairs or extensions. The plan may have to be approximate to start, but as valves are located and other information gathered, a good as-built can be developed.

A good operation and maintenance program will include such activities as opening and closing all the gate valves in a system every six months and flushing fire or flush hydrants every six months. If valves fail to operate properly they should be replaced or repaired on a timely basis. The total system should be visually inspected by driving or walking it every week and by visiting each service regularly. Visiting each service can be done while water meters are being read if meters were installed. If not, the area should be visited regularly. For many rural systems, meters are read or the home visited on a 3-6 month basis. If

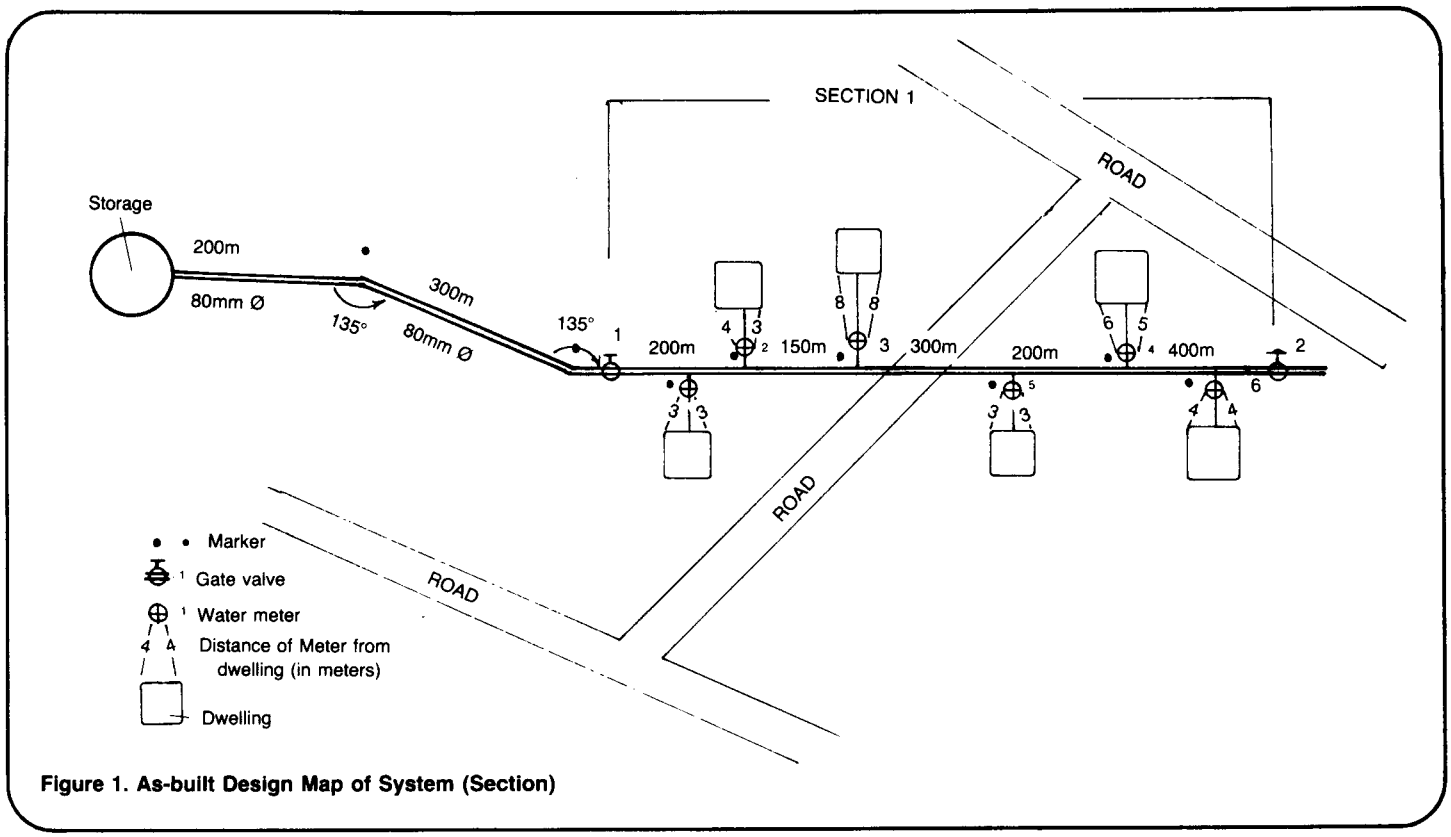

Figure 1. As-built Design Map of System (Section)

water meters are installed, they should be removed and tested for accuracy every 3-5 years. Many operators routinely replace the parts subject to wear at that time.

The person responsible for operation and maintenance should record the results of inspections and activities for future reference. Table 1 is a list of activities that should be conducted on a scheduled basis.

Table 1. Operation and Maintenance Checklist for Community Water Systems

Daily	-Observe all public watering points morning and evening; make corrections as required -Record water level in storage tank -Make routine repairs -Provide service connections as required
Weekly	-Walk or drive water system; pay particular attention to wash stream and road crossings and to any construction activity near the water line
Monthly or Quarterly	-Read all water meters or visit service connection sites
Semi-annual	-Open and close all gate valves; record the number of turns both to open and to close -Look for signs of leakage in the gate valve boxes -Flush all hydrants until the water flows clear; note any odors
Annual	-Remove and test/repair one fifth of the water meters in the system; this will assure that all of the system meters are repaired or replaced every 5 years

Common Operation and Maintenance Problems

Although relatively few things go wrong with household water connections or service lines there are some common problems. One is covers left off of meter and valve boxes. Children often throw objects down valve boxes when they are open and this can cause a valve wrench to jam. Another common problem is damage from vehicles being driven over valve boxes. Corrosion of metal pipe is not unusual.

Occasionally, a service line crossing a street or road is crushed or develops leaks for other reasons. Repairing a leaking service line under a road can be a costly, time-consuming task. If the service line is copper, it can be replaced by coupling a new line to the existing line, tying the opposite end of the existing line to a backhoe bucket or other pulling device, and then pulling the old line out until the new line is positioned in place. As a safety precaution, keep personnel well out of the way, in case the line should break while pulling.

If the existing line is plastic tubing, it will probably break if pulled. In this case, a 16mm stainless steel aircraft cable is pushed through the existing line by hand. Tape the end of the cable with electrical tape to prevent snagging. Attach the new line to a tee. Loop the cable through the straight section of the tee. Clamp with a cable clamp and tape the loose end. Attach the opposite end of the cable to a backhoe or other pulling device and pull the cable until the new line is positioned under the street. See Figure 2.

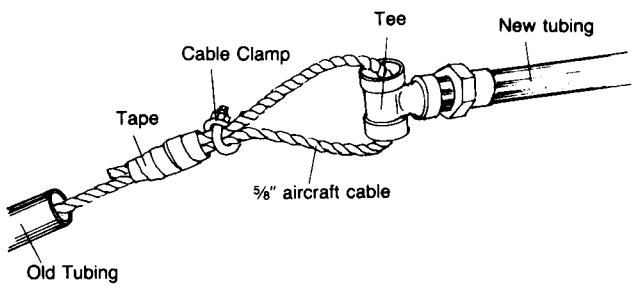

Figure 2. Replacing Plastic Pipe Under a Road

The primary problems with household water connections will be with leaking faucets and toilet bowls in the house. Since the water used is not metered in many rural systems, the customer does not pay for the wasted water and the leaks are allowed to continue or worsen. These systems usually have a shortage of water. When one or more people waste water, others have to do without or additional sources must be developed to serve them. This costs all the users money. It is important that the customers be motivated to repair all leaks. One method is to provide training and handouts telling how to repair the leaks.