

# Wells

**Choosing a site**

**Digging the well**

**Using the well**



## INTRODUCTION

There are 2 types of well - dug wells and boreholes. Which type you use depends on your situation.

**Dug Wells** - used where the water is less than 24 metres below the ground. They are cheap to install, easy to maintain and can be dug by the community. Water is usually drawn by bucket, chain and windlass.

**Boreholes** - used where water is much further below ground and hand pumps are used to draw water. Boreholes have to be sunk with specialist equipment. They are much more expensive to install and maintain.

All wells **MUST** have a Well Committee to organise maintenance.

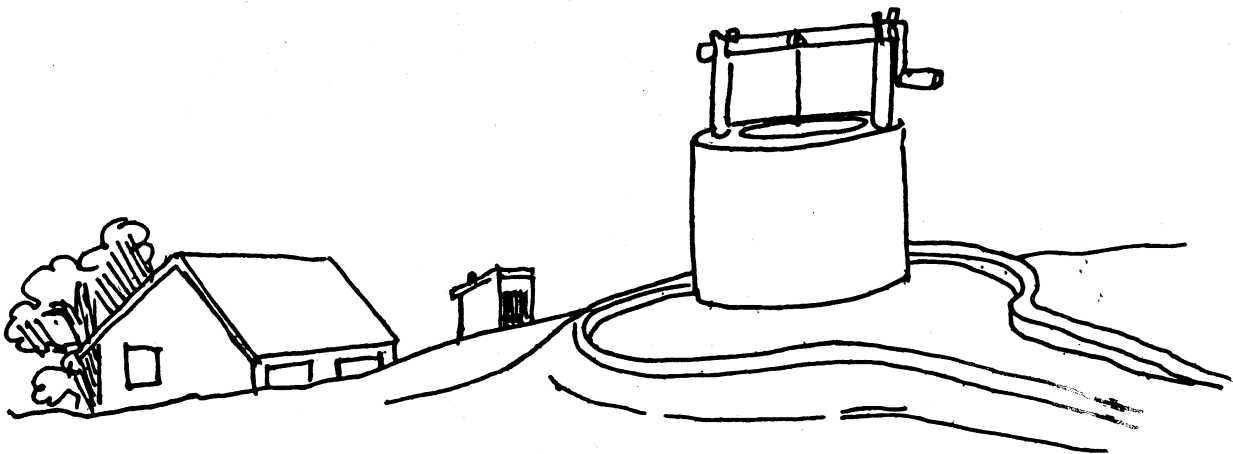
This book will only discuss how to construct a dug well. If you are putting in a borehole it will be done by specialists.

## SITING

The water in the well must not be polluted.

Ideally the well should be at least 100m away from any pit latrines, if space allows.

Try to site the well uphill of any latrines, so there is even less chance of pollution.



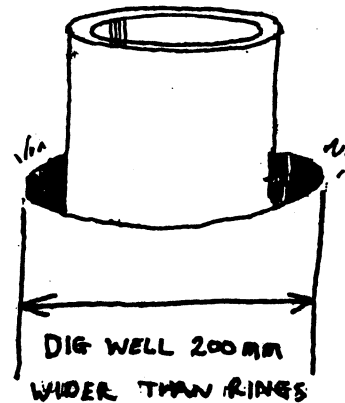
## DIGGING THE WELL

The main community contribution will come from digging the well. Follow these rules.

-The best time to dig the well is towards the end of the dry season, when the water should be at its lowest possible level.

-The well should be dug at least 200mm larger in diameter than the concrete rings you will be using.

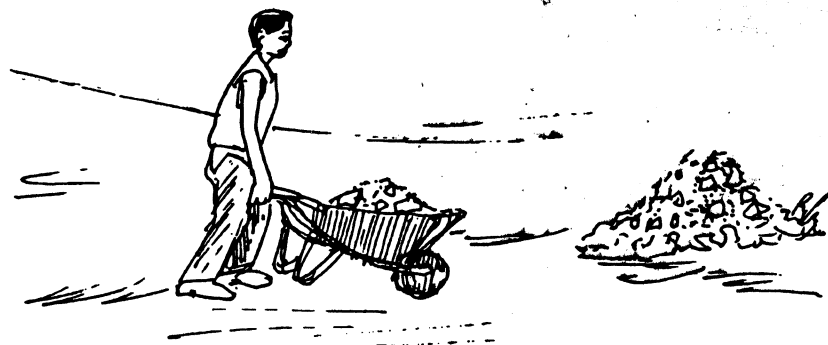
-NEVER allow one man to dig alone. There must always be someone at the top of the well in case of problems. They must agree a system of signals so the digger and the man at the top always know what the other requires.



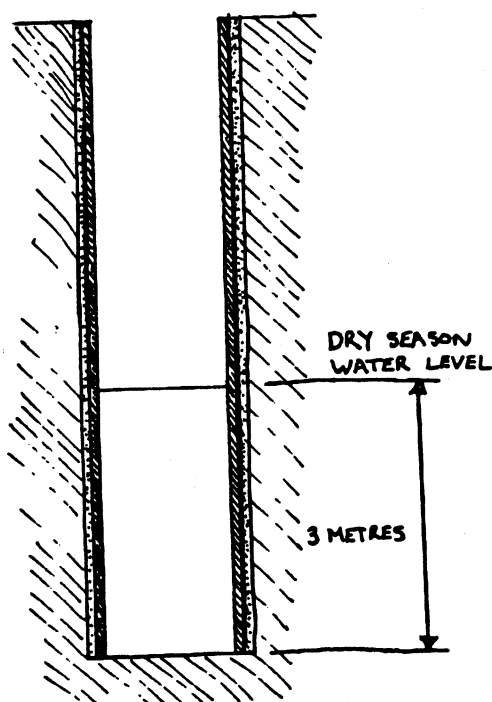
The top of the pit must be secure. Timber shuttering must be made if the soil is loose or sandy.

-Make sure that the ropes and supports used to lift the soil are strong and secure.

-Ensure the soil is taken at least 4 metres away from the top of the well to prevent accidents.

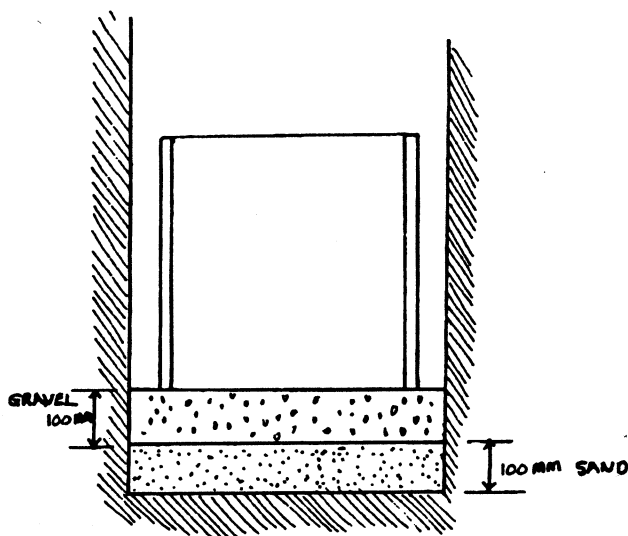


-Make sure the well is dug exactly vertical. Check it frequently.



-Ideally the well should be dug at least 3 metres deeper than the dry season water level in order to provide enough water for a community.

-The bottom of the well should have a 100mm layer of gravel on top of a 100mm layer of sand. This filters the water coming into the well.

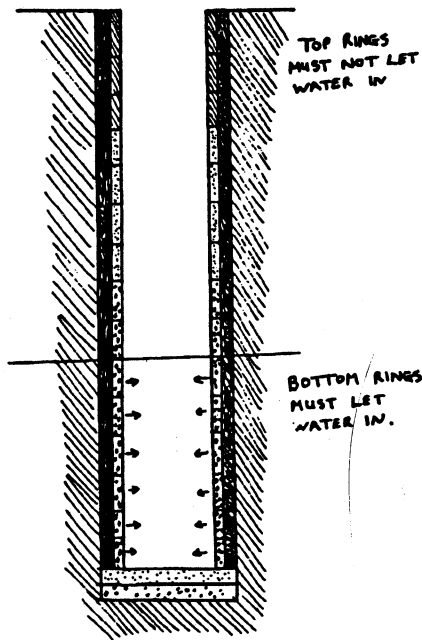


- If a lot of water comes in while you are digging, try to borrow a pump from the Department of Water Affairs, an NGO or some other local organisation.

## RING MOULDS

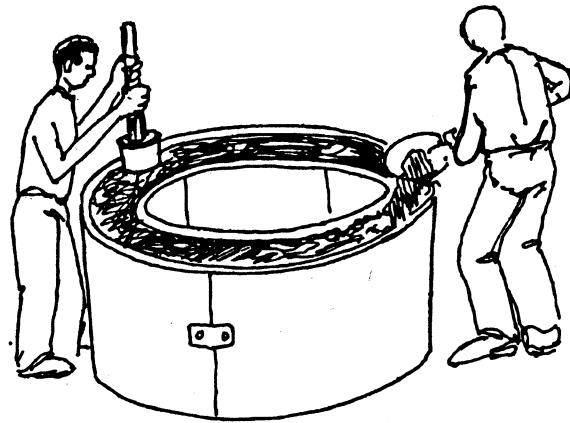
You may be able to buy the rings already made. Ask at the Department of Water Affairs. However if you have to make the rings yourselves, hire the ring moulds and follow these steps:

-the rings in the top 3 metres of the well **must not** allow water to get in. This prevents pollution of the well. A 1:2:4 concrete mix for these rings will make the concrete watertight.



-water should be able to get through the lower rings. A concrete mix of 1 part cement to 8 parts stone for these rings (no sand) ensures they will allow in water.

7-the concrete should be poured and compacted in layers.



-leave the concrete in the mould for at least 24 hours

-the top ring and inner section can then be removed, but do not remove the bottom ring and outer section. This will support the ring.

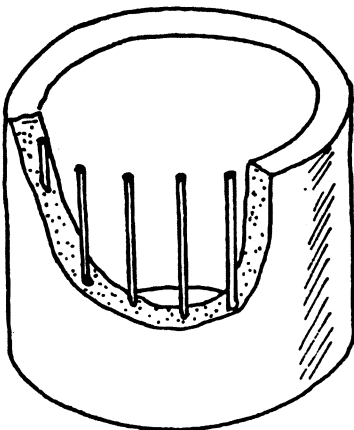
-leave for another 24 hours

-now the rest of the mould can be removed.

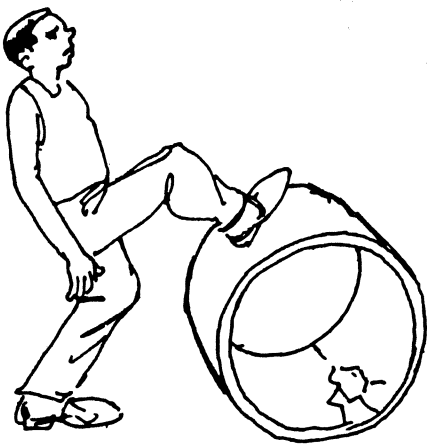
-leave the ring to cure for at least another 5 days. Keep the concrete damp during this time.

-clean the mould sections thoroughly before casting another ring.

-the rings can be reinforced by adding metal rods. These are not needed once the rings are in the well, but it makes them stronger for transporting and installing them. 10mm diameter vertical bars every 200mm around the ring provides sufficient strength.



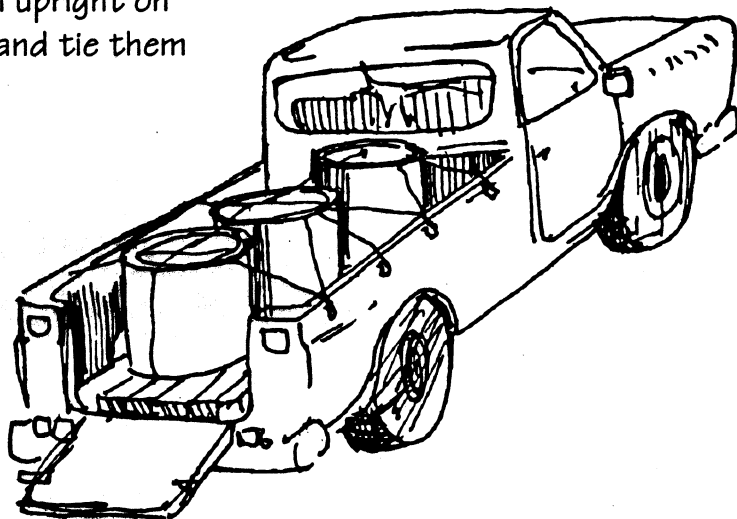
## TRANSPORTING RINGS



-never roll rings along the ground. They will break.

-always lift and carry rings from place to place.

-if you have to transport rings by vehicle, place them upright on wooden supports and tie them down well.

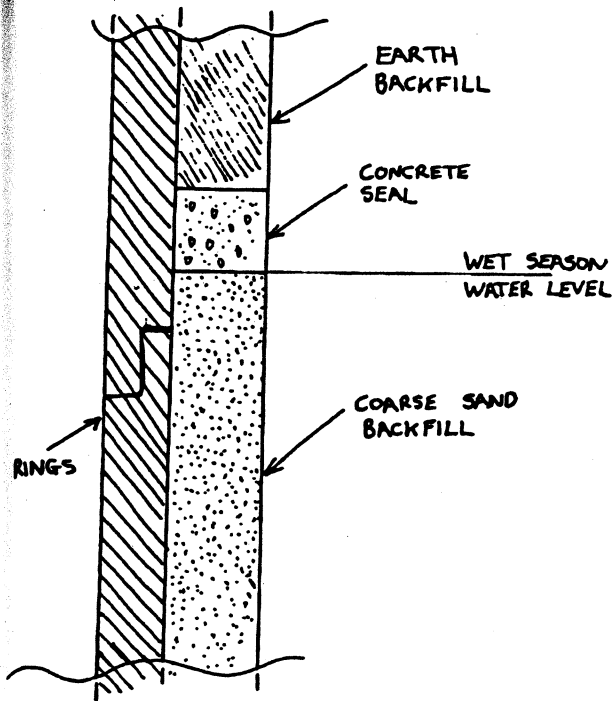


## INSTALLING RINGS

-a tripod and pulley system is required to install rings in the well.

-make sure the lifting system is strong enough.

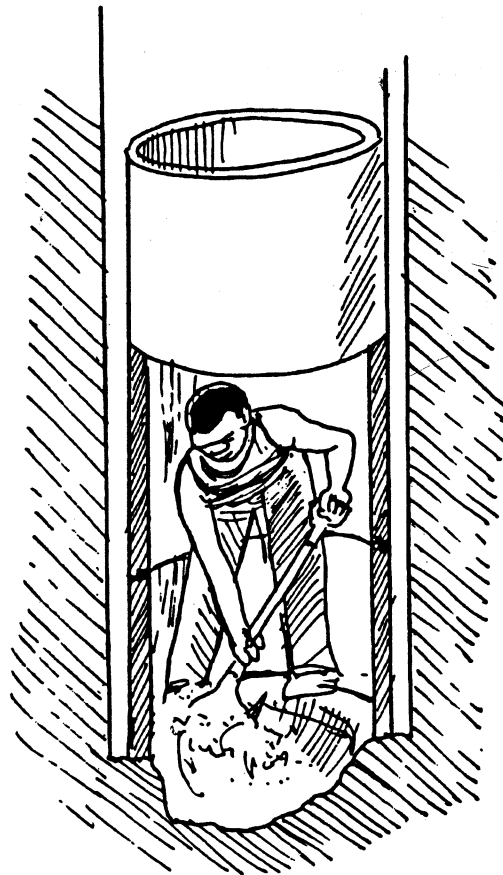
-each ring should fit neatly into the next.



-backfill around each ring. The rings below wet season (March) water level should be backfilled with coarse sand. A layer of concrete should be poured on top of this to prevent polluted surface water getting into the well. The remainder is backfilled with earth.

### DETAILS OF BACKFILL

The best and safest method of installing rings is for the first ring to be lowered into the well and the labourer digs beneath it. The ring drops as the earth is removed. The next ring is added and the process repeated. This method stops the sides collapsing as the well is dug - an event that is common and causes serious injury.

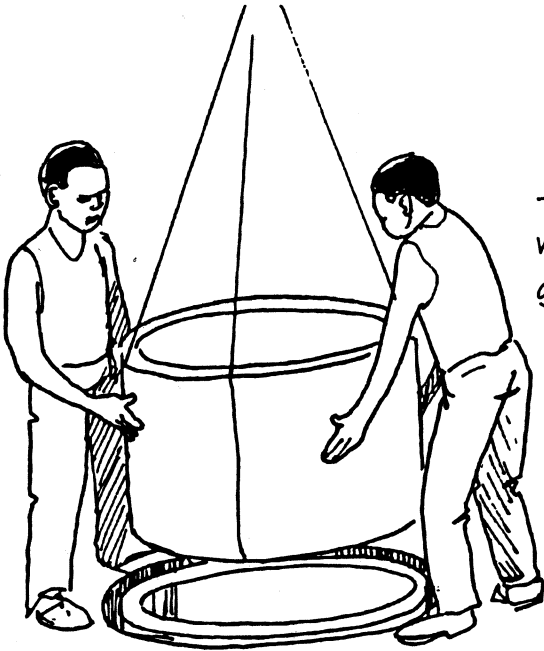


## IMPORTANT

NEVER dig more than 5 metres without installing either more rings or timber shuttering to prevent collapse.

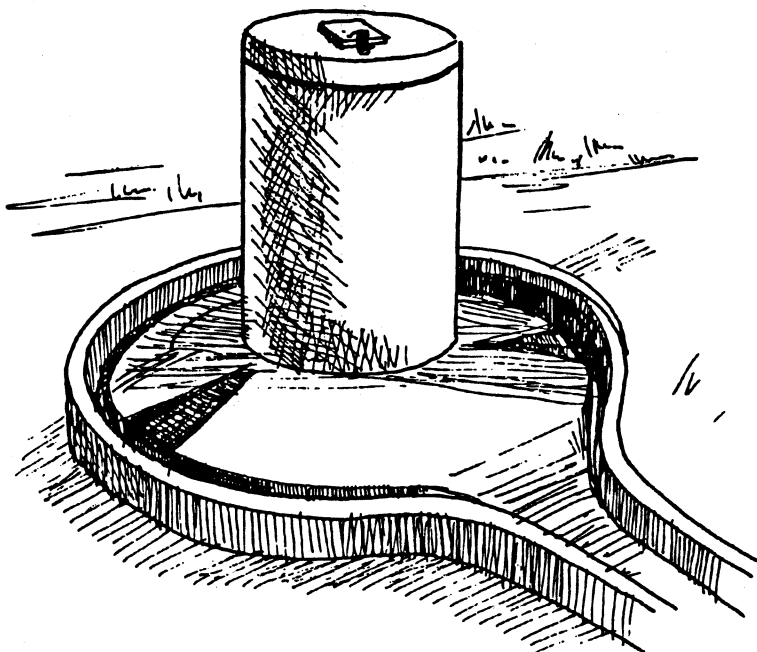
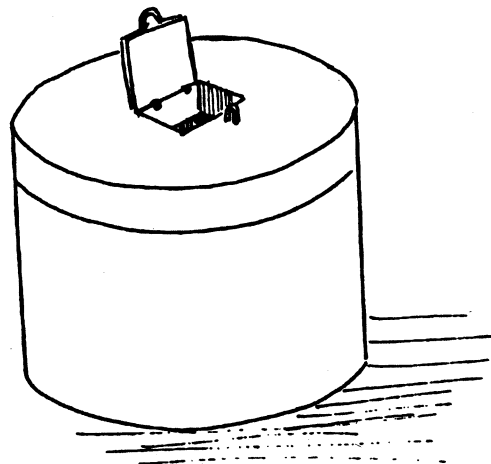
## DRAINAGE

The top of the well must be clean, safe and protected from surface water.



-either build a wall around the top of the well, or add an extra concrete ring above ground level. Plaster the wall.

-cast a reinforced concrete top to cover the well. This should be about 125mm thick.



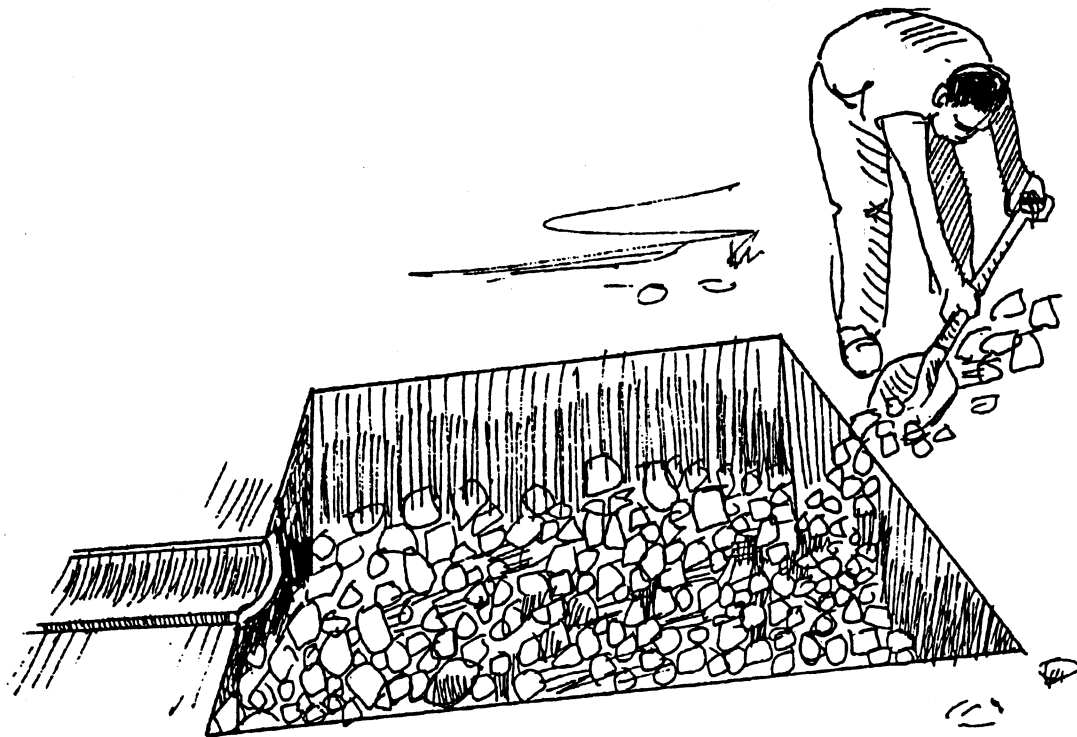
-lay a 75mm thick concrete slab for 2 metres around the well. This is called the APRON. It should be at a slope with a drain around the sides to carry spilled water away. The apron should be built on a well compacted hardcore base.



-have a lid over the well to stop anything falling in. Make sure the lid is kept locked and only opened by a member of the well committee.

-make a good drain leading at least 15 metres away from the well.

-dig a large, deep pit at the end of the drain and fill it with rubble. This is called a SOAKAWAY and allows water that is spilt to drain away gradually.



## CLEANING THE WELL

The first water that is taken from a dug well will be too dirty to drink. The well must be cleaned before it is used. The best way to do this is to empty the well 3 times before drinking any of the water.

If the well fills up quickly this may not be possible using buckets. Perhaps you can borrow a pump.

There are also chemicals that you can put into the well to make the water safe to drink. Talk to the Department of Water Affairs about these.

## EDUCATION

Do not let your well become polluted.

- Do not let people throw anything in the well
- Do not wash clothes or children near the well.
- Do not let people use their own buckets to draw water from the well.
- The Well Committee must organise "Education Days" and talks by Public Health officials to educate the community about proper use of the well.

### KEY POINTS

- make sure wells are protected from all sources of pollution
- ensure you have a well committee
- ensure all digging work is carried out SAFELY
- make sure you build a good well apron, drain and soakaway
- have a lid on the well and keep it locked when not in use
- educate the community to use the well properly