

# **Guidelines for the construction of Dug Well**

## **A. Dug Well Survey**

- 1) Survey and collection of records (number, location, present situation) of any existing DW in the area should be made.
- 2) Causes of unused DW should be collected.
- 3) Attempts should be made to renovate existing DW if possible.
- 4) In case of non-availability of any such records, a test borehole should be made to make a bore log at the site.

## **B. Site Selection**

Site is selected considering following factors :-

- 1) Areas of peaty soil should be avoided for DW as these cause the water to have an unpleasant taste and smell;
- 2) There should be a stable soil layer at the top ( a clay layer is preferable);
- 3) Presence of a sandy layer within 9 to 12 m (30'-40' from ground level);
- 4) The site must be at least 30' away from any existing latrine;
- 5) The site must be at least 30' away from a pond;
- 6) The site must be at least 30' away from a river

## **C. Dug Well Configuration**

- 1) Inner diameter should be minimum of 88.2 cm (3');
- 2) Depth of DW varies with the soil condition and water availability of the site. Depth should be such to ensure 1 to 1.5 m (3'- 6') water column at the driest period;
- 3) Height of head wall is 1 m (3.5') above ground level;
- 4) A sanitary seal of 1 m (3') from the ground level should be provided;
- 5) About 59 cm (2') apron is provided all around the well;
- 6) 1.17 m (4') x 75 cm (2.5') platform is provided for TW installation beside the apron;
- 7) Length of drain pipe attached with TW platform varies from 1.5 m to 3 m (5'-10');
- 8) DW should be covered to protect it from outside contamination ensuring proper ventilation and sunlight. The cover is made following WHO guidelines. Or a 0.4 m (1'4") by 0.15 m (6") wire mesh should be placed on the head wall, for ventilation and a roof on the top with translucent sheet to facilitate illumination and sunlight.

## **D. Manpower**

- 1) Trained workers (mistris) are used for construction;
- 2) At least 6 workers (mistirs) should be employed for construction work- 1 head mistri, 2 assistant mistris and 3 local persons to help the mistris so that they become trained after construction of a few DW.

## **E. Construction**

- 1) DW should not be constructed a pre-specified depth, as required depth will depend on the soil and water table conditions. Instead it is better to construct dug well in the dry season, with the objective of achieving about 1 to 1.5 meters of water in the DW upon completion. This procedure will ensure a sufficient depth of water to remain serviceable year-round.
- 2) Concrete rings are inserted after completion of digging and the rings should be joined by cement to prevent contamination by percolating water;
- 3) Where the sub-soil formation is not stable enough, the method of caisson driving (widely used in bridge construction), may be used;
- 4) Where self-sinking method is used, the first ring of the DW should be robustly fabricated with a cutting edge;
- 5) To prevent sand boiling rings should be jointed together using cement mortars inside and outside of rings and joint-less flexible PVC floating pipe can be connected with TW. Iron rings, connected with concrete rings can be used to hold this flexible pipe;
- 6) To prevent accidents, during construction of DW, due to collapsing of side-soil and occasionally asphyxiation from carbon dioxide and methane gases- rope, ladder, Bosun's chair etc should be kept at the site. None should be allowed to work alone.

## **F. Water Quality**

- 1) 30 cm (1') layer of brick chips should placed at the bottom of the well. 1.8 cm or 3/4" chips are placed at the bottom in 10 cm (4") layer, 1.3 cm (1/2") chips are placed in next 10 cm (4") and 2.5 cm (1") chips are placed in the last 10 cm<sup>4</sup>;
- 2) Water parameters should be tested in the laboratory at least two times a year. These parameters should be: pH, colour, turbidity, iron, manganese, chloride, total dissolved solids, total coliform, faecal coliform and arsenic.
- 3) Well water should be cleaned yearly. For this 2 kg lime is thoroughly mixed with 35 L of water and then it is poured in the well. The well water is stirred and then kept unused for 3 to 4 days. After 3 days the well is unloaded. The well is then filled with fresh water seeping from the aquifer.