



General Guidelines for Construction of a Rainwater Harvesting Tank in Schools

Criteria for Rainwater Harvesting project location (distance to building (min-max), parent material, hydrology):

Selection:

- Make a list of schools/community centres where drinking water is a problem due to:
 - Low seasonal rainfall in tropical zones
 - High salinity in groundwater of area
 - High grade of toxic mineral contamination
 - Non availability of water sources- surface water (pond, river, tanks)
 - Bacterial presence in the existing surface water sources

Water Resource Mapping:

- A water resource (mapping) survey to be carried out in the beginning of the project.
- The general information of all types of existing water sources (well, handpump, piped water supply, pond, river, streams, brooks, etc.) in a village and its maintenance pattern.
- Seasonal availability of drinking water from all the sources, quality of water, an approximate idea of community demand for drinking water (total population) to be collected for generating reports of water resources.
- Survey can be conducted by village people/teachers/students. Community contribution/demand etc.

Survey of Local Area:

- Available area of rooftops of school/community building(in sq mt./ft.)
- General gradient/trend of rooftop (flat cement concrete roof and two sided sloping galvanized tin roof)
- Type of vegetation around the building/area
- Average annual rainfall data
- Drainage pattern of rooftop through drain pipes to the ground or open flow for direct runoff of rainwater.

Type of Soil:

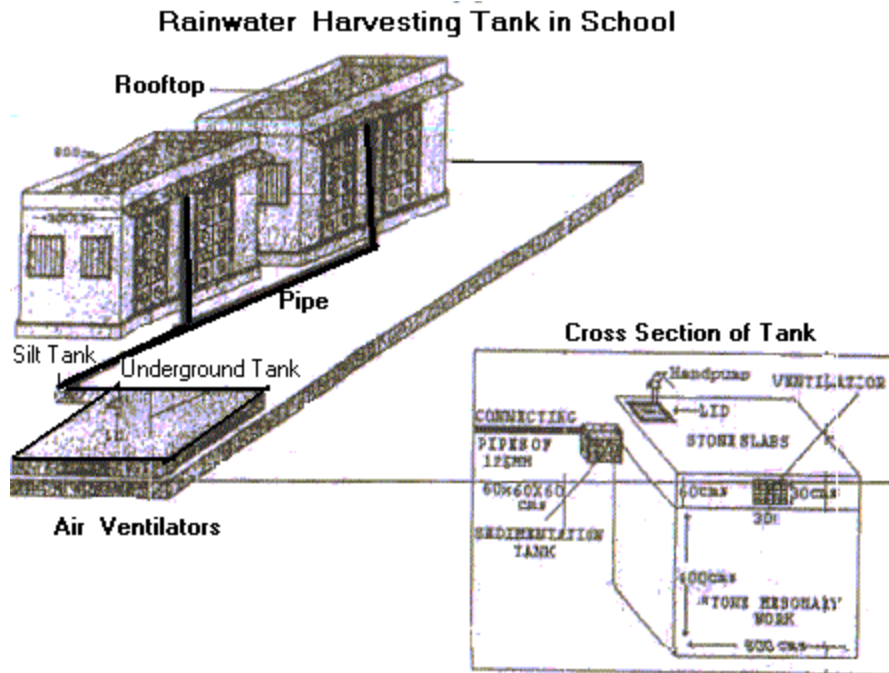
On the basis of hardness of soil, generally we have soft and hard formations of soil.

We also can categorise as:

- Sandy soil
- Clay mixed with lime kankers
- Muram (white limes with small size gravels)
- Conglomeration of all
- Hard rocks (sedimentary/metamorphic)
- Weathered formation of hardrock



Location of tank:

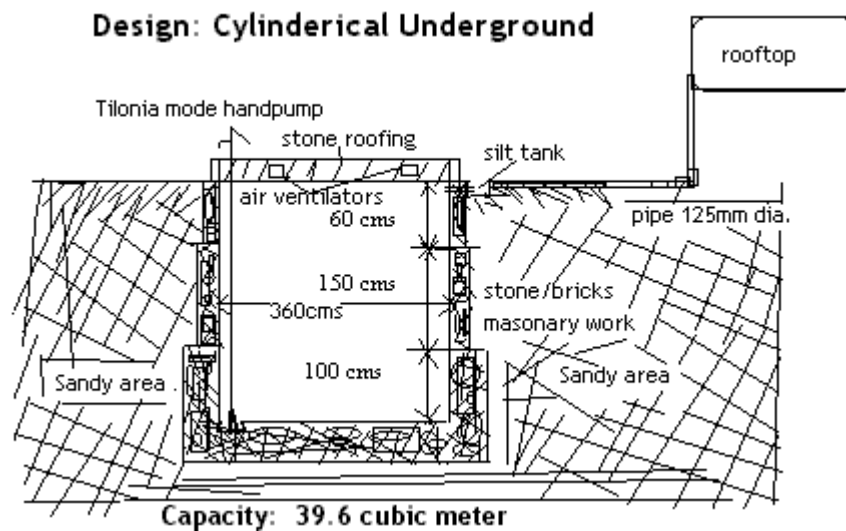


1. Tank should be close to the main building and offer easy access to water by school children.
2. The distance of the tank from the building depends upon area: 3 to 5 feet in hard subsurface; if soft formation, distance should be more (10 ft.)
3. Minimum length of pipes should be used to avoid the chances of blockage. Large diameter pipes (at least 4 inches) are suggested to connect rooftop to tank.
4. If subsurface is hard, do not try to dig a deep pit. A tank can be raised 1/3rd above the ground surface and 2/3rd in the ground.



General guidelines for construction:

- **When to start (dry season?, how much time before the rainy season?),**
- **Material for construction**
- **Selection of tank design (ferro cement or cement, if no roof available then rainwater collection area on top of the tank) etc);**

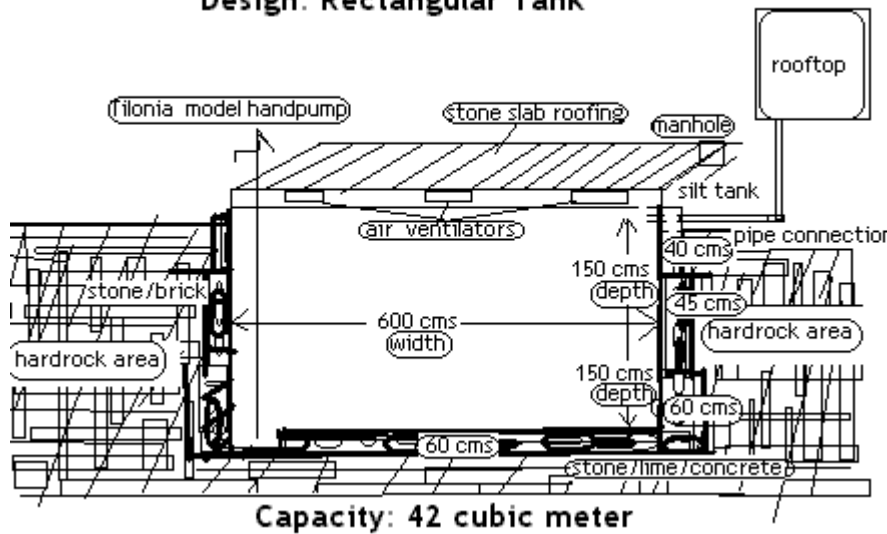


Example Rainwater Harvesting designs of different constructions from Rajasthan:

Shape of tank depends upon the soil type and basic traditional designs are rectangular and cylindrical(round).

Cylindrical design is particularly suitable for desert areas. Nobody can believe or imagine that local village masons (barefoot architects) can construct cylindrical tanks and deep wells (100 mts. deep) in local material. This is difficult to construct by a qualified engineer, but the community of local architects can construct such a rainwater storage system.

Design: Rectangular Tank



Materials for Construction:

- Local building material (bricks/ stones)
- Lime/cement
- Water proofing powder (gypsum)
- Coarse sand
- Roofing material (ferro cement/sandstone slabs) depends upon area.

1. Is transportation easily available for material? age structures and deep wells in desert area. The centuries old and inexpensive traditional constructional technique of water structures is only with the village community of Thar desert of India.
2. Rectangular tank is good for hardrock area. This is an easy process to dig a pit manually and make a roof in local stones. The rooftop of tank can be used for school class in winter or school stage.

Why are underground tanks built for rainwater storage?

- Only a underground tank built in lime or local material is suitable to keep rainwater fresh till next rainy season.
- This is a natural anti-climatical water storage device which provides warm water in winter and cold in summer.