

Case study 5

10m³ ferrocement tank, Nagercoil, India

Introduction and background

This RWH system is an example of a suburban solution to inadequate water supply from the municipal authorities. Although the family have a piped supply connected to the main town supply, the reliability of this supply is very poor the piped supply provides water only every 8 to 10 days and the quality of the water is questionable. The family also has a groundwater supply but this, too, is unreliable. Their solution was to construct a RWH tank and harvest water from their roof. The traditional Nalluketta building style of this area, as shown in Figure 1, lends itself well to RWH. The central rooftop courtyard above a single storey dwelling makes an ideal collection area.

The system was installed as part of a programme run by the Centre for

Appropriate Technology, an NGO based in the town of Nagercoil. They have installed more than 100 such systems in the area.

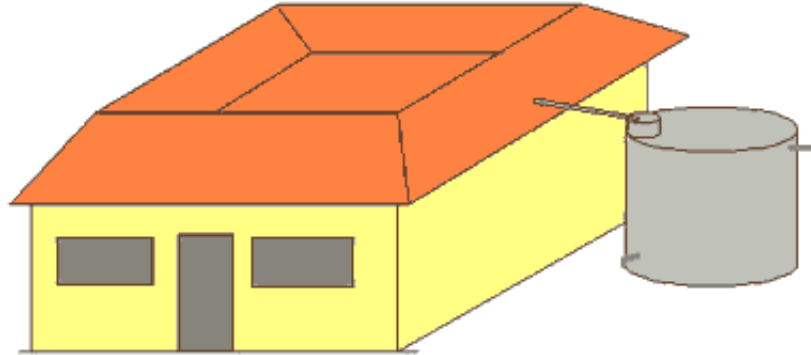


Figure 1 - Showing the traditional Nalluketa roofing style

Technical detail

Tank details

The tank is a cylindrical ferrocement structure, with a diameter of 2.5m and a height of 2m. There was little detail available regarding construction details but it appears from the corrugations on the exterior that a zinc sheet mould had been used to cast the tank. The tank is set on an 18" concrete plinth

which means that a bucket can be placed comfortably under the extraction tap while still keeping the extraction pipe near the bottom of the storage area, therefore not wasting any storage capacity. The tank cover is formed using corrugated asbestos sheets. The tank is fitted with an overflow pipe near cover level.

[Figure 2 Photograph of the tank and roof \(click text to see\)](#)

[Figure 3 - Photograph of tank \(click to see\)](#)

First flush is achieved by simply moving the down pipe away from the inlet basin. There is a pre-filter basin which sits on top of the cover. It contains a plastic bowl which has been punctured repeatedly to allow water to pass through, as with a sieve. The bowl is filled with small stones and sand which acts as a filter. The bowl and basin have been cemented in place to prevent water entering the tank through the joints. A water level sight tube has been fitted but is too discoloured by sun and silt to be of any use.

Catchment area

The catchment area, as mentioned earlier, is the rooftop of the house. Because the rooftop is rather unusual in design (see Figure 1) and the collection area is the internal rooftop courtyard, it is required that the downpipe pass through the roof structure (see Figure 4). This can present problems if sealing is not effectual. The catchment could take place on the outer faces of the pitched roof but this would entail fitting guttering and fascia board, all extra expense. The catchment area is approximately 100m².

The pitched section of the roof slopes at approximately 35^o and is of pantiles. The central rooftop courtyard area is mostly flat with a mix of tiles and cement rendered surface. There are many trees overhanging the roof and it quickly becomes covered in leaves, which could block the downpipe.

[Figure 4 photo catchment area \(click text to see\)](#)

Annual rainfall in the region is about 1200mm. Normally there is a single wet season with a dry season which lasts about 4 months.

User regime

The catchment is about twice the size required to fill the tank, so the tank can be filled early in the rainy season. The families procedure during the rains is:

- to sweep the roof clean and divert the first rain runoff
- to fill the tank early in the wet season
- to then seal the tank (e.g. tape up the entry against mosquito entry)and divert flow away from it
- to use the water for premium quality purposes only during the following dry season: the stored water usually lasts until the next rains



Figure 5 - Pipe has to pass through roof, from central roof courtyard, to tank

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