

Rain Water Harvesting District Six Clinic, Cape Town

GGHH Agenda Goal: Water

Hospital Goals

- Reduce reliance on municipal water
- Build water resilience to maintain clinical operation amidst an intense drought
- Save water & cost

Progress Achieved

- Reduction in water consumption from municipal sources achieved
- Water resilience strategy constructed
- Cost savings on water achieved

The Issue

The new District Six Clinic was commissioned in 2018 for the Western Cape Department of Health, amidst an intense drought. The Clinic was fitted with a rain harvesting system. Water usage and rain harvest were measured to establish the facility's water resilience and prepare for a potential Drought Day-Zero scenario.

Strategy Implemented: Design

The facility's domestic water usage is designed to be fed & boosted from two sets of reservoirs, situated on the roof.

1. The first are 2x5000 liter tanks supplying all wash hand basins. This is supplied by potable municipal water via the dedicated meter. Tanks are mechanically kept full.
2. The second are 3x5000 liter tanks supplying sluices and toilets. This is supplied by the basement harvesting reservoir & pump set (as first priority), and also by the boosted WHB (1), as second priority. The link between the two reservoirs is fitted with a non-return valve and meter. The prioritization of the supplies is regulated via a float system.

The harvesting reservoir is 6x5000 litre tanks, which are fed from roof runoff collected by hidden downpipes. These divert runoff to the tanks under gravity via a rooftop leaf trap and two centrifugal filters. These cleaning mechanisms are essential to maintain water quality.

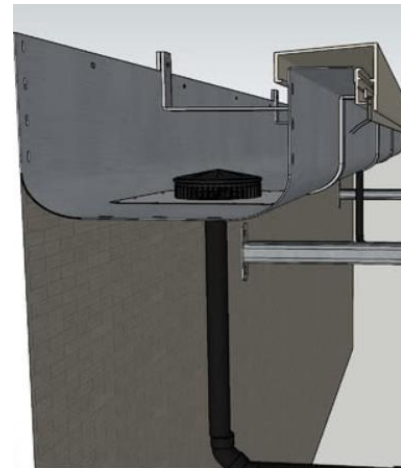


Even though the system is designed to prioritise rainwater usage, it can be operated to store water in anticipation of a 'Day-Zero' event, by disarming the float control (2) and prioritising municipal supply until the stored supply is required.

Implementation process: Water Quality

Maintaining quality of water is essential as it is flushed through a health facility. For this reason, the harvesting reservoir is situated in the basement where cool conditions and an absence of UV light restrict organism cultivation. It is also important to restrict debris and organic matter from entering the system. A two-tier filtering system is employed with appropriate result:

1. Rooftop Filtering - At the collection point to the downpipes, inside the gutters, is an external siphoning filter, preventing leaves from entering the system. The type used is a Geberit Pluvia. It is low maintenance and requires only periodic rinsing, depending on the leaves in the area.



2. Centrifugal filtering - At the assembly of the downpipes, prior to entering the reservoir tanks is a mechanical centrifugal filter. This flushes all remaining debris down the storm-water system and allows clean water to the tanks. The type used is Wisy WFF100/150. It requires no maintenance; however, it does reduce harvest quantity due to the self-cleaning mechanism.



Tracking Progress

- Measurement Period: 28/2/2018 – 30/6/2018
- Measure Intervals: Weekly
- Measurement Parameters: Date; Precipitation (mm); Municipal meter (kl) on Mount street; Runoff collected in Harvesting tanks (kl) in basement; Water fed between rooftop reservoirs (kl) on roof; Fire supply meter (kl) on Mount Street

Results

- Operating 5 days a week during business hours, the clinic uses 4.56 kiloliters water per operational day from all sources. Confidence is high as the variability is low.
- No fire water was used.
- As per graph below, the amount of water harvested correlates narrowly to precipitation, with the variance attributable to wind direction and saturation hurdle. Note the rate drops for higher precipitation events.
- Rain harvesting translates an average of 4.1 millimeter rainfall into 1 kiloliter of usable water. Using average rainfall statistics of 700mm per year, the facility will harvest approximately 175 cubic meter water per year.
- During the period measured, harvested water contributed to 21% of the facility's total water consumption.

Next Steps

With the favorable results achieved, this design will be replicated to other facilities

Demographic information

District 6 Clinic in Cape Town, is part of the Western Cape Government's department of Health, which comprises of over 200 facilities and over 25,000 Health care staff.

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