



DEWATS™ for Seven Hills Hospital

Mumbai, Maharashtra

PROJECT BRIEF

Seven Hills Healthcare Limited had appointed Pondy Auroservice Consultants Pvt. Ltd. for architectural and engineering design of the hospital building. This included the design of the sanitation facilities for the campus.

Pondy Auroservices Consultants Pvt. Ltd., in turn, approached CDD Society to help with a comprehensive and sustainable solution for treatment and recycling of domestic wastewater generated at the hospital. We have setup a DEWATS™ under the roads on campus, which is located at Marol in Mumbai.

PROJECT OUTCOMES

- To treat the wastewater as per State Pollution Control Board standards
- To reuse the treated wastewater for flushing and landscaping

SYSTEM IN BRIEF

The DEWATS™ unit comprises of Primary and Secondary treatment unit. For Tertiary treatment, conventional filtration method has been used. As the quantity of wastewater generated is high (812 m³/day), the grey and black wastewater streams have been separated and treated in 2 clusters.

A Grease Trap (GT) has been provided for the wastewater generated from the canteen; and the overflow is connected to the black water Settler.

In cluster-1, 406 m³ of wastewater (50 m³ from the Grease Trap, 125 m³ of black water & 231 m³ of grey water) is provided first level of treatment in black & greywater settlers. The treated wastewater is then conveyed into two secondary treatment units (Integrated Anaerobic Baffle Reactor + Anaerobic Filter for blackwater and Anaerobic Filter unit for greywater) for further treatment by gravity flow.

In Cluster-2, the remaining wastewater (131 m³ of blackwater & 275 m³ of greywater) is treated in Settlers, the Anaerobic Baffle Reactor + Anaerobic Filter & Anaerobic Filter units. The effluent from the treatment modules is stored in a common collection tank for reuse.

SALIENT FEATURES

Source: Domestic wastewater from kitchens, bathrooms, toilets and laundry washing

Design Capacity: 812 m³/day

No of Users: 5,000

Peak flow: 8 hours

Influent quality: BOD : ~450 mg/l
COD: ~900 mg/l

Effluent Quality: BOD: < 30 mg/l
COD: 106 mg/l

PROJECT SPECIFICATIONS

Funding Agency: Seven Hills Hospital

Implementing Agency: Pondy Auroservice Consultants Pvt. Ltd.

Supporting Organisation: CDD Society

Construction Cost: Rs. 3 crores

Start of Operation: 2010

Current status: Commissioned & operational

Area per beneficiary: 0.39 m²

CapEx per beneficiary: Rs. 6,000

OpEx per beneficiary: Rs. 6

MODULES ADOPTED

Number of Settlers: 5

Volume (per settler): 289m³

Area of construction (per settler): 215m²

Baffle reactor with Anaerobic Filter - 1&2

Volume: 835 m³

Area of construction: 625 m²

No. of chambers (per AF): 15 (3 X 5 rows)

Anaerobic Filter - 1 & 2

Volume: 545 m³

Area of Construction: 460 m²

No. of chambers (per AF): 15 (3 X 5 rows)

Common Collection Tank

Area of Construction: 630 m²

Area required for Cluster-1 & 2: 1,950 m²

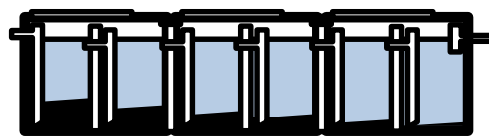
PROCESS FLOW DIAGRAM



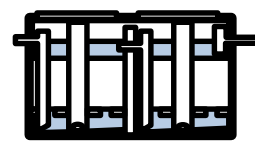
Grease trap



Settler



Anaerobic Baffle Reactor
(ABR)



Anaerobic
Filter (AF)

Settler: is a sedimentation tank for retaining particles by settling over a specific time frame.

Anaerobic Baffle Reactor: ensures anaerobic degradation of suspended and dissolved solids by mixing fresh wastewater with an active sludge blanket.

Anaerobic Filter ensures fixed digestion of the suspended solids.

OPERATION AND MAINTENANCE

The wastewater treatment plant is operated and maintained by a trained operator of Seven Hills Hospital.

Cost incurred for O&M per annum is approximately 0.05% to 0.1% of the total project cost (which works out to be in the range of Rs. 15,000-30,000).

Operations

- Checking Wastewater flow in all units and clearing the blockages (in registers).
- Regular pumping of wastewater from balancing tank and also for reuse purpose is needed.



Maintenance

- Removal of sludge in settler and integrated ABR & AF once in two to three years.
- Replacement of filter media should be done in once in five years in the filter chambers.

REUSE OPTIONS

- The treated wastewater is reused for gardening and flushing purposes.

PERFORMANCE OF DEWATS

Sample points	COD mg/l	pH
Date of sampling: 25/4/2014		
Blackwater Settler inlet	117	7.76
Greywater Settler inlet	62	7.56
Anaerobic Filter Out	52	7.48



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