

# Refurbishment of toilet with DEWATS™ at Government Girls High School, Devanahalli, Karnataka

## PROJECT BRIEF

Government Girls High School (GGHS) has 235 students and 12 staff members. 9,600 litres of water is supplied to the school every week. The school has three toilet blocks, of which only the staff toilet is usable.

The two toilet blocks for the girls had become unusable as there were no water nor electricity connection. As a result, the girls were practicing open defecation behind the school premises – which was attracting a lot of flies. This was also a little dangerous as the area behind the staff rooms and kitchen was grassy, and hence potentially could have snake holes.

Further, wastewater from the staff toilets and kitchen was flowing onto open land behind the school, encouraging mosquito breeding. Considering these issues, the two unusable toilet blocks were renovated with a complete end-to-end liquid waste management system.

## PROJECT OUTCOMES

- Efficient management of liquid waste generated at the school's premises
- To protect the environment of the school from direct pollution

## SYSTEM IN BRIEF FOR BLACK WATER

Domestic wastewater from the school is conveyed to the treatment system through a sewer network. The system consists of the following modules:

1. **Settler:** is a sedimentation tank for retaining articles by settling over a specific time frame.
2. **Anaerobic Baffle Reactor:** ensures anaerobic degradation of suspended and dissolved solids by mixing fresh wastewater with an active sludge blanket.
3. **Anaerobic Filter:** comprises of a filter bed for treatment of dissolved organic matter. Here, wastewater comes in contact with an active bacterial mass which grows on the filter material

There is also a soak pit, for the safe disposal of treated water.

## SALIENT FEATURES

**Source:** 8-seater toilet, 16 urinals, washbasins

**Design Capacity:** 2 m<sup>3</sup>/day

**No. of users:** 247

**Peak Flow:** 4 hours

**Influent quality: BOD:** 1,000 mg/l

**COD:** 2,000 mg/l

**Effluent Quality:** After secondary treatment

**BOD:** 38 mg/l

**COD:** 127 mg/l

**Efficiency:** 73%

## PROJECT SPECIFICATIONS:

**Funding Agency:** Oracle

**Implementing Agency:** CDD Society

**Construction cost :** Rs. 9.26 lakhs

**Construction period:** 4 months

**Start of operation:** March 2019

**Current status:** Commissioned & operational

**Area per beneficiary:** 0.04 m<sup>2</sup>

**CapEx per beneficiary:** Rs. 3,725

## MODULES ADOPTED

**Settler**

**Volume:** 3.4 m<sup>3</sup>

**Area of construction:** 4 m<sup>2</sup>

**Anaerobic Baffled Reactor**

**Volume:** 2.1 m<sup>3</sup>

**Area of construction:** 2.8 m<sup>2</sup>

**No. of chambers:** 2

**Anaerobic Filter**

**Volume:** 3.0 m<sup>3</sup>

**Area of construction:** 4.8 m<sup>2</sup>

**No. of chambers:** 2

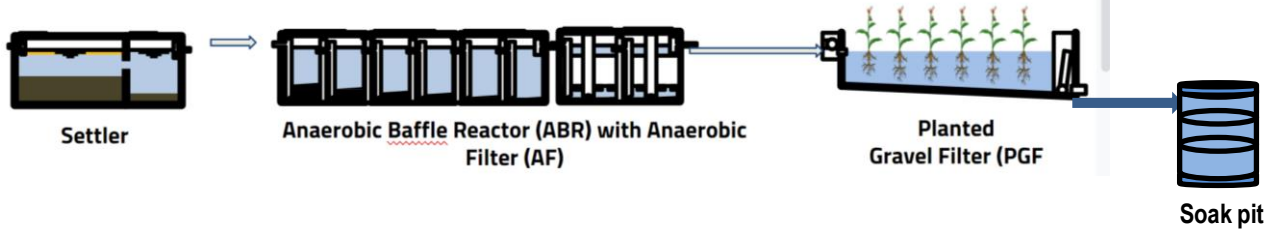
**Collection Tank**

**Volume:** 3m<sup>3</sup>

**Area:** 0.9 m<sup>2</sup>

**Built up area:** 12.5 m<sup>2</sup>

## PROCESS FLOW DIAGRAM



## SYSTEM IN BRIEF FOR GREYWATER

Greywater from the school's kitchen and handwashing area is conveyed to the treatment system through a pipeline. The treatment system consists of the following modules:

- 1. Floor trap:** retains the organic food particles in the wastewater from the kitchen; and floating materials in the wastewater from the bathroom, sinks and washing area
- 2. Settler/Grease Trap:** is a sedimentation tank for retaining food and oil particles by settling over a specific time frame.
- 3. Infiltration trench:** Here the greywater undergoes filtration through coarse to fine gravel layers, finally seeping into the ground. This eventually helps in recharging the ground water table.

## SALIENT FEATURES

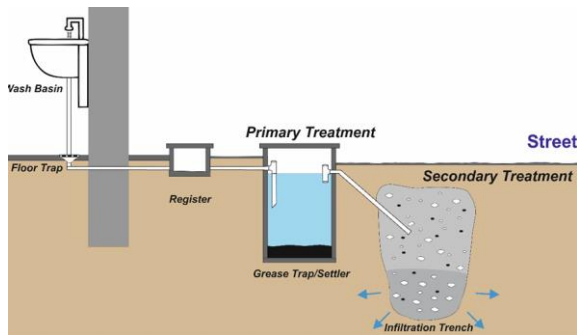
**Source:** Kitchen, wash basin  
**Design Capacity:** 1.8 m<sup>3</sup>/day  
**No. of users:** 247  
**Peak Flow:** 1 hour

## MODULES ADOPTED

**Settler**  
**Volume:** 1.2 m<sup>3</sup>  
**Area of construction:** 1.3 m<sup>2</sup>

**Infiltration trench**  
**Volume:** 1.2 m<sup>3</sup>  
**Area:** 2 m<sup>2</sup>  
**Built up area:** 3.5 m<sup>2</sup>

## PROCESS FLOW DIAGRAM FOR GREYWATER



## OPERATION AND MAINTENANCE

- The wastewater treatment plant is operated and maintained by the school. We have provided the school with a manual to aid in the same.
- A regular schedule will be followed for maintenance and includes periodic check of all modules, removal of sludge from the baffle reactor and removal of scum from the settler/grease trap.
- The filter media in the anaerobic filter and infiltration trench will be washed once in five / seven years.