



# Construction of a Boys Toilet Block and DEWATS™ for Government Junior College

## Devanahalli Market, Karnataka

### PROJECT BRIEF

Government Junior College (GJC) is located in the town of Devanahalli, 50 km north of Bangalore city. The school consists of 400 students and staff.

The school consists of a boys' toilet block, a girls' toilet block, a kitchen and a handwashing facility. The school consumes roughly 8,000 litres of water daily.

Blackwater from the toilets was being disposed, without treatment, into an old unused well, whereas greywater from the kitchen and the handwashing facility would flow into the open and dry up. This attracted flies and other vectors. In addition to a treatment system to treat the wastewater generated within the school's premises, school authorities requested for an additional boys' toilet block, to cater to the high number of male students in the school.

### PROJECT OUTCOMES

- Efficient management of wastewater generated within the school premises
- To protect the environment from direct pollution.
- To educate students and staff about sanitation and help them understand the need for such infrastructure.

### SYSTEM IN BRIEF FOR BLACK WATER

Wastewater from domestic sources from the school toilet building is conveyed to the treatment unit through a sewer network. The treatment system consists of the following modules:

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

An old unused well has been improvised to serve as a soak pit, where the treated wastewater is disposed.

### SALIENT FEATURES

**Source:** 3 toilet blocks used by 450 students and staff

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

**No. of users:** 400

**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. 11.62 lakhs

**Built Up area:** 15.73 m<sup>2</sup>

**Construction period:** 4 months

**Start of operation:** March 2019

**Current status:** Commissioned and Operational

**Area per beneficiary:** 0.08 m<sup>2</sup>

**CapEx per beneficiary:** Rs. 2,907

### MODULES ADOPTED

#### Settler

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

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

#### Anaerobic Baffled Reactor

Volume: 5.76 m<sup>3</sup>

Area of construction: 4.6 m<sup>2</sup>

No. of chambers: 3

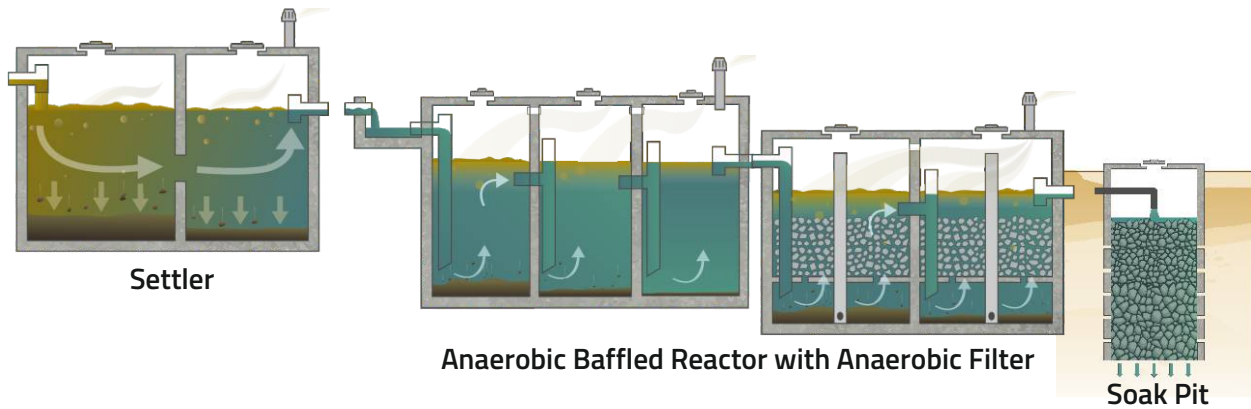
#### Anaerobic Filter

Volume: 3.48 m<sup>3</sup>

Area of construction: 4.6 m<sup>2</sup>

No. of chambers: 2

## 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:

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

## SALIENT FEATURES

**Source:** Kitchen, wash basin

**Design Capacity:** 1.8 m<sup>3</sup>/day

**No. of users:** 400

**Peak Flow:** 1 hour

## MODULES ADOPTED

**Settler** - Volume: 1.2 m<sup>3</sup>

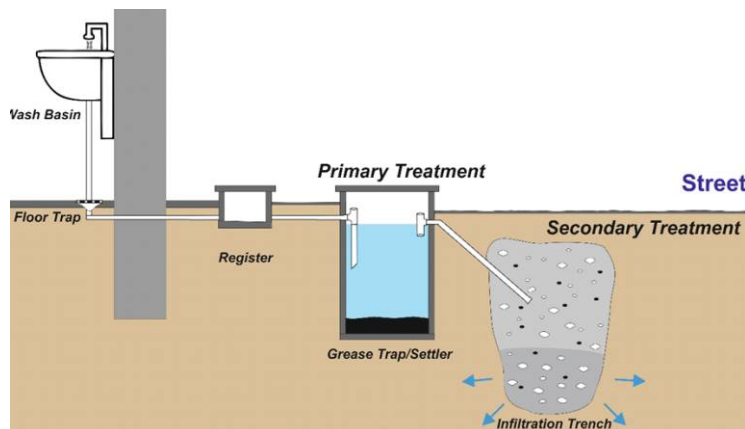
Area of construction: 1.3 m<sup>2</sup>

**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



Greywater Management System for Handwashing Area and Kitchen



## OPERATION & MAINTENANCE

- The wastewater treatment plant is operated and maintained by the school.
- A regular schedule will be followed for maintenance and includes periodic check of all modules, removal of sludge in baffled reactor and other required tanks as mentioned in the Operations and Maintenance manual provided to the school.
- The filter media in the anaerobic filter will be washed once in five / seven years.



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Survey No.205 (Opp. Beedi Workers Colony),  
Kommaghatta Road, Bandemath Kengeri Satellite Town,  
Bangalore 560 060, Karnataka, India.

+91-80-28486700

bangalore@cddindia.org