

7.1.4 : Water conservation facilities available in the Institution:

Waste Water Recycling:

Liquid Waste Management:

Waste water generated from Amrutvahini Campus includes sewage from the educational buildings, boy's hostels, girl's hostel and staff quarters etc. It needs treatment before discharging it as effluent into natural stream/river etc. and same treated waste water can be utilized for various purposes like gardening and irrigation. To treat waste water, innovative 3E (Eco-friendly, Economical, and Efficient) microbial technology has adopted by the institute. In 2019, Sewage Treatment Plant (STP) having capacity of 0.4MLD is started.

Sewage Treatment Plant Installation cost (INR In lakhs) = 35.5

Sewage Treatment Plant:Photos





Amrutvahini College of Engineering, Sangamner





Amrutvahini College of Engineering, Sangamner





Sewage Treatment Plant: Information

7.1.3
STP

Amrutvahini Sheti and Shikshan Vikas Sanstha's
Amrutvahini College of Engineering, Sangamner

Sewage Treatment Plant at AVCOE Campus

➤ **Objective:**
To treat 0.4 MLD of wastewater generated from campus and its reuse for Gardening and Irrigation Purpose.

➤ **Context:**
Wastewater generated from Amrutvahini Campus is about 0.4 MLD, which includes sewage from the educational buildings (Day scholar students, Teaching, Non-Teaching staff, office staff etc.), Boys Hostel, Girl hostel and staff Quarters etc.

It needs treatment before discharging it as effluent into natural stream/river, etc., and same treated wastewater can be utilized for various purposes like gardening and Irrigation. To treat wastewater, 3E Technology is adopted by the institution (Eco-Friendly, Economical, Efficient).

➤ **Practice:**
Treatment plant contains 3 Major Tanks.

- Collection Tank
- Bio Tower
- Bio Filter

Functioning of these three tanks is as follows:

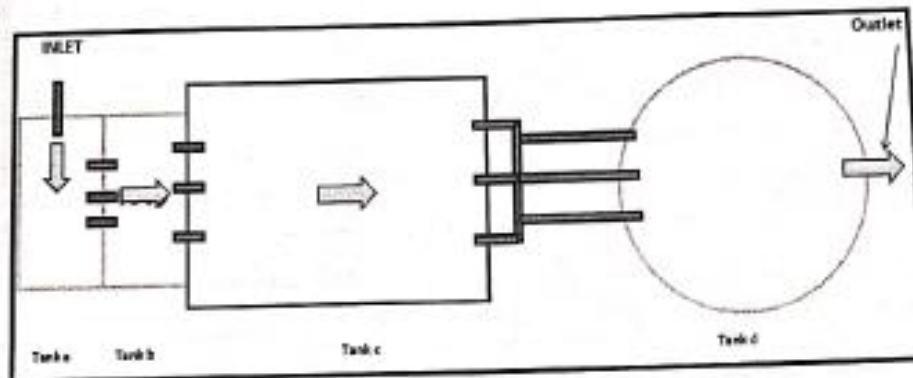
a) **Collection Tank:**
Control the velocity of wastewater, and it gets collected into a collection tank. Heavier material/particles settle down by its weight, and floating material can be taken out with the help of net.

b) **Bio Tower:**
Bio tower contains 20mm aggregates and coating of bio-film around it, which reduces colour, odour and approximately 40% of BOD.

Scanned with CamScanner

e) Bio Filter :

This Unit maintains the pH of water, and it reduces the BOD to 30 mg/l, reduction in colour and E-Coli count. Growth of Bacteria in this filter is in multiples of 10^{10} . Bio filter contains black cotton soil and the addition of bacteria which decompose and degrade the wastewater and make it useable for agriculture and irrigation purpose.



Tank a: Collection Tank

Tank b : Bio Tower

Tank c: Bio Filter

Tank d: Temporary storage tank

Figure: 1 Showing the layout of the plant

➤ Practice adopted for Testing of sewage samples

The Sewage Treatment Plant at A.V.C.O.E. campus is capable of treating around 0.4 MLD, i.e. four lacs litres of wastewater per day generated from student's hostels, staff-quarters, and academic buildings etc. To meet the quality, i.e. effluents discharge standards as per CPCB (Central Pollution Control Board) and MPCB (Maharashtra Pollution Control Board) norms and evaluation of overall working efficiency of the plant, several physical and chemical characteristics needs to be tested on a regular basis.

The parameters like pH, colour, odour, total dissolved solids (TDS), total suspended solids (TSS), are analyzed daily while on priority biochemical oxygen demand (BOD), and chemical oxygen demand (COD) are analyzed every week. The samples are being collected from the inlet and outlet chamber of STP.

All these tests are carried out in Environmental Engineering Laboratory of Department of Civil Engineering of the institute with the required precision and utmost care. However, it is the policy of institute to send the samples to NABL (National Accreditation Board for Testing's and Calibration Laboratories), and MoEFCC (Ministry of Environment, Forest and Climate Change) certified laboratory once in a month. The report of the same is regularly

submitted to CEO of the AS&SV Sanstha through Chief coordinator of the sewage treatment plant.

In case of any inconsistency related with working of the STP, field expert's opinion is advisable.

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Laboratory Services Division

TEST REPORT				
Sample Report No.	E-10-20-001	Report Date	20/10/2019	
Name and address of Client	Shri. Nandashree Mahane At Post: Sangamner, Dist: Sangamner, Maharashtra			
Sample Submitted to	Customer	Sample Description: Type	Sewage Effluent	
Sampling Location	STP Outlet	Date - Receipt of Sample	19/10/2019	
Sample Quantity: Packaging	1 L + 2 Ls (Water Tight)	Date - Start of Analysis	19/10/2019	
Order Reference	Verbal Discussion	Date - Completion of Analysis	20/10/2019	

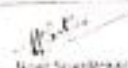
No.	Parameter	Result	Unit	Method
CHEMICAL TESTING				
1	pH	7.27		Standard Method
2	Total Suspended Solids	12	mg/L	Standard Method
3	Biochemical Oxygen Demand (5 Days at 20°C)	41	mg/L	Standard Method
4	Chemical Oxygen Demand	120	mg/L	Standard Method
5	Total Dissolved Solids	604	mg/L	Standard Method
6	Phosphate (as P)	0.01 (0.1)	mg/L	Standard Method
7	Total Nitrogen (as N)	44.3	mg/L	Standard Method
BIOLOGICAL TESTING				
8	Total Coliforms	33	MPN/100ml	Standard Method
9	Fecal Coliforms	9.3	MPN/100ml	Standard Method



KABU
Kerala Agricultural University
AUTHORIZED SIGNATORY



(In Report)



Technical Manager (Chemical)
AUTHORIZED SIGNATORY

Note:

- The result listed refers only to the tested samples and applicable parameters.
- This report is not to be reproduced except in full without written approval of the laboratory.
- * Not included in our HMBI Scope.

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Figure: 2 Test Report of Sewage Sample

➤ Advantages of 3E Technology are listed below:

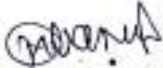
- Less Mechanical Machinery,
- Savings in Electricity Bills,
- Very Less Sludge Generation,
- No Odour Problem,
- Area requirement is also less,
- Skilled supervision is not required,
- Eco-Friendly

➤ Benefits of the Project:

- Earlier well water/river water was utilized for gardening purpose, but after installation of plant treated wastewater is being used for gardening and irrigation purpose which saves natural water.
- As mechanical parts are negligible, so there is saving of electricity which strengthen green campus motto.
- Students gets aware of Environment and understand the concept of Save Water and Save Energy, which leads to the sustainable development of the campus.
- **Durability** : More Durable as compare to MBBR and Other Technologies as less machinery and its components parts and very less electric equipment's involved in the treatment process.
- **Maintenance**: After 2 to 2.5 years, additional bacteria are required to add in the Bio Filter, and the top layer of sand in the bio filter have to replace.
- **Annual Maintenance Cost**: It is 10% of the actual cost of plant for one year approximately. After 2 to 2.5 years, around 30% of the total cost of the plant will be the actual cost of bacteria for the symbiotic process.



Figure: 3 Photograph showing Sewage Treatment Plant


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