



ADITYA ENGINEERING COLLEGE

An Autonomous Institution

Approved by AICTE • Permanently Affiliated to JNTUK • Accredited by NAAC with 'A' Grade

Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

Aditya Nagar, ADB Road, Surampalem - 533437, Near Kakinada, E.G.Dt., Ph:99498 76662

Sewage Treatment Plant

Technical Report:

Wetlands like freshwater ponds, marshes, and swamps are natural water purifiers; these wetlands improve water clarity and quality by removing the sediments, toxins, and pollutants. Due to the rapid increase in population and increase in demand of land use the numbers of natural wetlands across the globe are decreasing. Constructed wetlands are used for wastewater treatment or for grey water treatment.

Constructed wetland system is most economical system in treating the waste water when compared to the present waste water treatment methods. Also the cost of fresh water is too high in present days so that we can minimise this cost as this Construction wetland system is only one time investment and can use the water from this system throughout the year without any other costs.

In economic point of view, the fresh water for gardening approximately costs up to rupees 7 to 8 per litre but when it is for treated water it costs only up to rupees 3 to 4 per litre and also there would not be any problem of over extraction as it is a continuous process from waste water.

The other objectives of the project are, to treat and analyze the waste water generated in the mess, to compare the results with standards and study whether the treated water can be used for gardening the plants, to reduce water shortage in hostels during summer, to calculate the removal efficiency of various parameters.

The purpose here is to treat the generated domestic waste water from "Sri Lakshmi Aditya Boys Hostel Mess" situated in Aditya Engineering College, Surampalem, Andhra Pradesh, India by using constructed wetland to reuse the water for gardening. The type of artificial wetland adopted is Sub-surface horizontal flow wetland. Constructed wetland is divided into two cells with dimensions **3m X 1m X 1m (LXBXD)** each.

The efficiency of the constructed wetland is evaluated by comparing the quality of water that pass through root zones of two different plant species. So that we can conclude which plant species had effectively removed the contaminants.

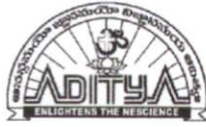
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The type of vegetation we have adopted are of two different species i.e. and *Phragmites Australis* (kanum gaddi), *Canna Indica* (metta mandhaara) for the process of Phytoremediation as it refers to the use of plants and soil microbes to reduce the concentrations of the contaminants.

For determining the properties and quality of water, the analyses are done for pH, Turbidity, Total Dissolved solids, Electrical conductivity, Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Bio chemical oxygen demand, Dissolved Oxygen, Phosphorous, Chemical oxygen demand, Chlorides, Sulphates and Ammonia.

Based on the analyses of various parameters of the water sample collected are compared against the standards in order to assess the quality of the water and it is concluded that the plant species ***Phragmites Australis*** is recommended to use when compared to ***Canna Indica*** for the waste water treatment.

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SEWAGE TREATMENT PLANT PROJECT

Details of Project



DIMENSIONS OF VARIOUS UNITS

Sedimentation tank-1	=	1.35m x 1.22m x 1.1m
Sedimentation tank-2	=	1.22m x 1.22m x 1.1m
Electric motor of capacity	=	1 hp
Concrete filling tank	=	1134.37 litres
Wet Land	=	3m x 1m x 1m
Collecting Water Tank	=	1000 litres per day
Total Cost	=	Rs 1, 42,296.20

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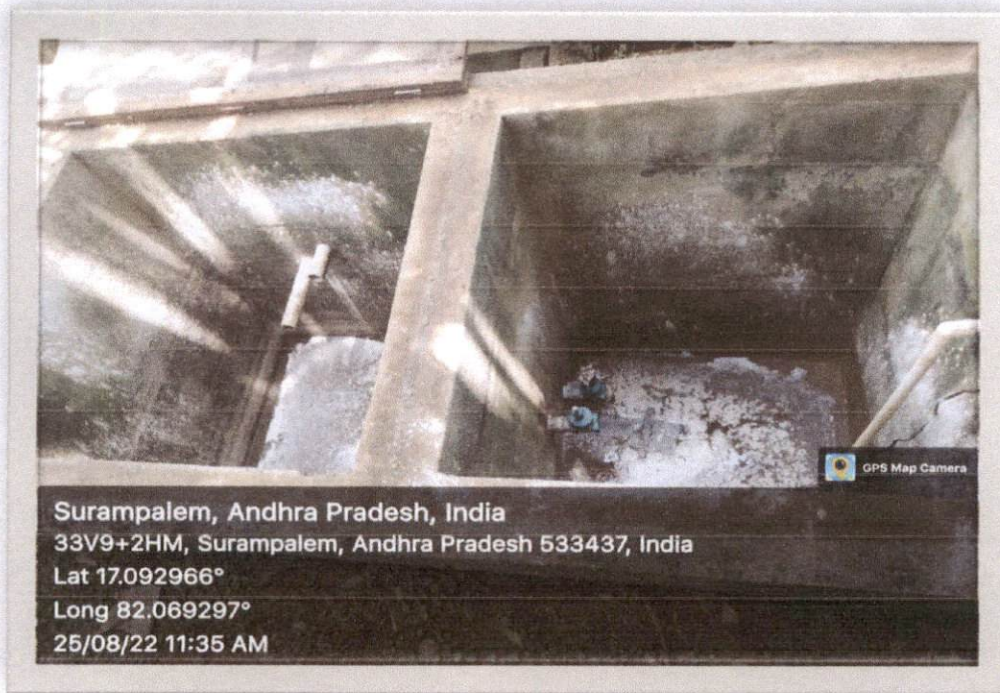
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Sewage Treatment Plant Structural Details

DIMENSIONS OF VARIOUS UNITS:

SEDIMENTATION TANK-1 and 2:

The dimension of sedimentation tank-1 is 1.35m x 1.22m and the depth of tank is 1.1m. This tank helps in removal of sediment materials and floating materials. The tank has the approximate capacity of 1000 liters.

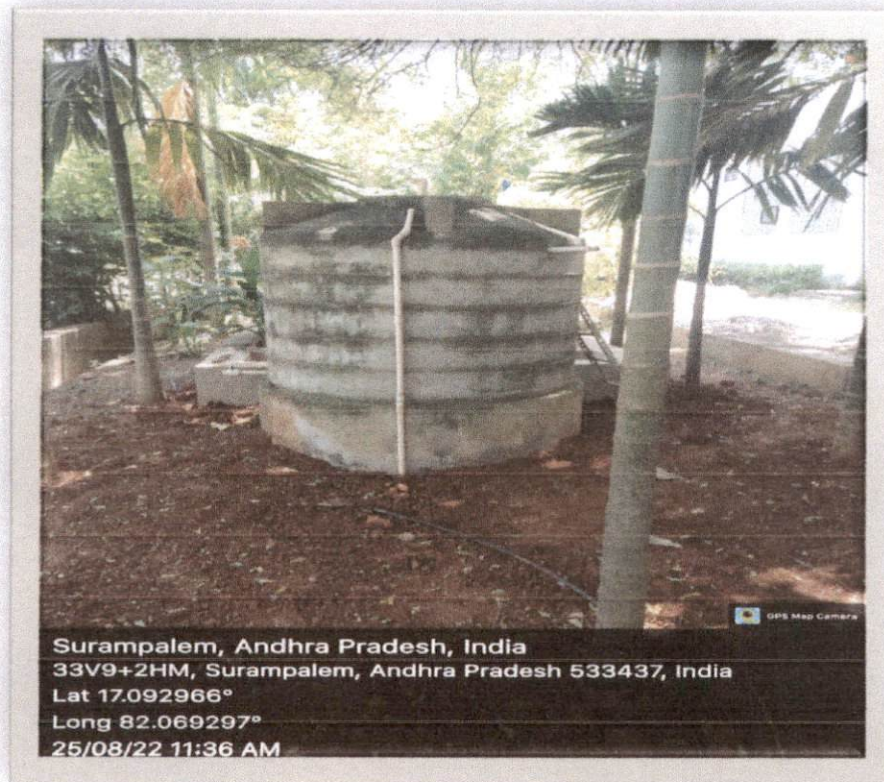


SEDIMENTATION TANK-1 and 2

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CONCRETE FILLING TANK:

The water collected and sediment on sedimentation tank is pump through electric motor of capacity 1 HP to the concrete filling tank which creates the gravitational flow of water to the wetland. The capacity of the concrete filling tank is 1134.37 litres. Suitable valve and regulator are fitted to the output pipe of tank for the regulating and controlling the flow of water to the wetland. Those regulators help to provide the continuous flow of waste water to the wetland through gravitational flow.



CONCRETE FILLING TANK

WETLAND:

The design and plan of the constructed wetland system is taken from the reference of Natural Resources Conservation Service Conservation Practice Standard (NRCS) – Constructed Wetland (IS CODE 656-2).

The water transfers to the wetland from filling tank through gravity flow in horizontal direction. There are two wetland cells provided with dimensions 3mX1mX1m (LXBXD) each.

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Wet Land

TREATED WATER COLLECTION TANK:

The dimension of the collection tank where the treated water gets collected from the wetland is at 1000mm depth. The capacity of the collection tank is 1000 litres.



Treated Water Collecting Tank

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