Treatment of Waste-Water of Educational Institution and Estimating the Cost of the Wwtp

Payal Maharathi

Abstract: ***Wastewater discharged from the institutions is white, acidic in nature ,turbidity is higher and high COD and BOD. Higher the values of the carbon dioxide and lower the value of chloride were noted for the waste water. Waste water which is rich in protein and fat content can be used as a feed for animals .Treatment of the waste water from GITA is treated and is utilized further for gardening purposes. The estimation of the entire construction of the plant was calculated and was constructed according to the plan .***

Keywords **:** ***Wastewater, treatment,disposal***

I. INTRODUCTION

In every town or city of different types such as spent water from bathrooms,kitchens,laboratory basins,house and street washing from various industrial processes dry refuse of houses and street sweepings,broken furniture,crockery wastes from industries etc..are produced daily.If proper arrangement for the collection ,treatment and disposal of all the wastes produced from the town or city are not made,they will go on accumulating of spent water in their foundation.The disease bacteria will breed up in the stagnate water and the health of the public will be in danger.All the drinkable water will be polluted.Total insanitary conditions will be developed in the town and it will become impossible for the public to live in towns or therefore in the interest of the town or city it is the nost essential to collect,treat and dispose of all the wastes products of the city in a way that it may not cause any havoc to the people residing in the town.

Wastewater treatment is a process used to converse waste water which is water no longer suitable for most of the recent use and which can returned to the water cycle with minimal environmental issues or reused.The latter is called as water reclamations and implies avoidance of disposal by the use of treated wastewater effluent for various purposes.Treatment of wastewater means the removal of the impurities from water being treated.The treatment of wastewater belongs to the several areas of public works ,it can be environmental with the management of human wastes ,solid waste,sewage treatment,storm water management,water treatment.The by products from the wastes water treatment plants that is termed as sludge will be treated in a WWTPs.

Sewage treatment is a process in the modern industrial world which uses chemical,physical and biological processes to clean wastewater in order to protect the environment and public health and animals.Ancient people used to create sewers for the removal of the foul smell of the used water and researchers are focusing on the construction of the sewers for the removal of the several harmful pollutants like carbon,inorganic and organic elements.Rapid growth of the population has brought several issues to the environment.

The wastewater treatment plant at Panjappur and waste-water reuse at Srirangam was taken for the study. The wastewater quality was studied by taking different samples and the results was compared with FAO irrigation water quality standard.[1]. Anaerobic systems proved to be an excellent treatment technology for many areas of the world. In future the traditional system of WWTP shall definitely compete more and more with UASB systems. The post-treatment required by the aerobic systems, which e.g. can be ponds, trickling filters or activated sludge plant[2].The re- pairing locomotives operations produces wastewater that contains organic substance contaminating in soluble (degreasers, engine cleaners, cleaning fluids, solvents, enamels, lacquers, epoxies, acids or alkalis), colloidal and particulate form. To eliminate the risks, the rail operator must realize an analysis related to the repairs process of locomotives, and search out actions to increase the environmental management of their motion[3]. Sanitation work in several developing countries concentrates on research on very rudimentary sanitation facilities such as stand alone septic tanks,composing toilets or pit toilets.Therefore this project has been designed to provide a comprehensive idea for establishing small sewage treatment plant within GITA institutions.The objective of the project is to treated the wastewater which can be utilized in gardening ,plantation purposes etc..It is decided to construct a prototype wastewater treatment plant of 15000liters per day capacity in GITA campus for treating the wastewater.

, rectification is not possible.

II. METHODOLGY

For this purpose,several manufacturing firms ,dealers for supply of such plants we have contacted.Six firms have quoted their rates and submitted the details.M/S ULTRA PURE has been selected for the purpose.The representative of the manufacturer visited the institute and presented their details and to the management.2.8lakhs have been proposed for the civil works only excluding the provision of pipes,site clearance ,site approaches,electrical connections etc.. which are also to be provided by the institution. The model represented the sewage treatment processes in three different ways,PRIMARY treatment,SECONDARY treatment and TERTIARY treatment.The primary treatment separates the floating material and also heavy settleable inorganic and organic solids.The primary treatment involves the screening process,grit chamber ,primary sedimentation tank. The secondary treatment involves the decomposition of fine organic matter to produce a clearer effluent.

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* Correspondence Author
Payal Maharathi*, Department of Civil Engineering, SRM University, Chennai (Tamil Nadu), India Email: niki.maharathi1@gmail.com

The secondary treatment include the trickling filtration processes and activated sludge treatment processes.The equipments used for the wastewater treatment plants are bar screen chamber, collection pump,anaerobic tank,course bar screen,transfer pump and use of microorganisms.

III. CALCULATIONS

Earthwork in hard soil with initial lead and lift including rough dressing and breaking clods upto 5cm to 7cm size and laying in layers each layer not exceeding 0.3m in depth etc..complete.

RATE FOR 100CUM
1.unskilled labour 43 nos @280.00/each=12040.00
2.Overhead charges 7.50%=903.00
3.Contactors profit 7.50%=903.00
Add 20% towards dressing and leveling,20% =2769.00
Add2/3 of rate for filling excavated material=11076.80
Add cess 1%=276.92
TOTAL=27968.92/100cum,say 279.69/cum
Filling in foundation and plinth with sand well watered and rammed including cost conveyance and royalty etc..
RATE FOR 100CUM
1.unskilled labour 12.36nos @280.00/each=3460.80
2.Overhead charges 7.50%=259.56
3.Contractors profit 7.50%=259.56
Rate per cum=39.80cum
Add for cost,carriage and royalty=645.84
Add cess 1%=6.86
Total=692.50/cum
Cement concrete(1:3:6) with 4cm size hard granite metal in foundation and plinth.
4cm size h.g. metal ,sand and cement that is 0.96cum @950/cum,0.48@ 170.00/cum and 2.29 Qntl @700 .Labour mason 2nd class and unskilled labour that is 0.18nos @350.00 each and 3.9nos @ 280.00 each .The total sum is 3751.60 which excludes the overhead charges 7.50% and contractors profit 7.50% .The lead cost along with the royalty if is added then 4cm size h.g. metal 0.96 cum@ 393.18/cum ,sand 0.48cum@ 505.84/cum and cement 2.29 Qntl @ 31.52/Qntl which is equal to 5006.77 ,add cess 1% that is 50.07 extra .
RCC Work of M-25 Grade with 20mm downgraded size hard granite chips including hoisting and laying.
1.Materials
20mm size h.g.chips 8.10cum@ 1600.00,10mm size h.g.chips 5.40 cum@1000.00,sand 6.75cum @ 170,cement 60.50Qntl. @ 700.00
2.Labour
Mate 0.86@300.00 ,mason 2nd class 1.50nos @350.00, unskilled labour 20nos @ 280.00
3.Machineries
Concrete mixer 6.0hours @177.00,vibrator 6.0hours @106.00, generator 33KVA 6.0hours @240.00
Total=71378.50,overhead charges 7.50% with contractors profit 7.50%.
Lead cost+royalty includes 20mm size h.g. chips 8.10 cum @393.18,10mm size h.g.chips 5.40cum@ 393.18, sand 6.75 @ 505.84,cement 60.50Qntl. @31.52, Cost for 15cum=6180.97 +cost for 1cum=61.81.Add cess 1% ,total=6242.
Supplying fitting and placing uncoated HYSD bar reinforcement complete asper drawing and technical specification.
GROUND FLOOR
HYSD bars 1.50MT @ 45,000,binding wire 8kg @79.00.
Labour:-
Mate 0.44nos @300.00,black smith spl. 3.00@500.00,unskilled labour 8.00nos @ 280.00.overhead charges 7.50% and overhead profit 7.50%.
Add lead cost,
HYSD bars 1.50MT @ 298.00,add cess 1%
Total=6042
12mm thick cement plaster(1:4) over brick work including cement punning for skirting
1.Materials
Sand 0.015cum @ 170.00,cement 0.0644 Qntl @ 700.00
2.Labour
Mason 2nd class 0.15nos @ 350.00,unskilled labour 0.11nos @ 280.00,overhead charges 7.50% and contractors profit 7.50%.
Add lead+royalty,sand 0.015cum @505.84,cement 0.0644Qntl @ 31.52,add cess 1%
12mm thick cement plaster(1:6) over brick work including cement punning for skirting
1.Materials
Sand 0.015cum @170.00,cement 0.0358Qntl. @ 700.00.
2.Labour
Mason 2nd class 0.15nos @350.00,unskilled labour 0.11nos @280,overhead charges 7.50%,contractors profit 7,50%
Add lead cost +royalty
Sand 0.015cum @505.84,cement 0.0358Qntl @31.52,add cess 1%
Rigid and smooth centering and shuttering for RCC works including false works and dismanting them after casting including cost of materials complete in ground floor
{1}RCC floor ,roof slab,landings,balconies,projecting sunshades and chajjas
1.Materials
Non sal wood scantling 0.112cum@ 17989.00,planks 0.34cum@9546,120mm dia sal bullah 56.0meter @92.00
Considering 10times use of the materials ,for use once
2.Labour
Carpenter 2nd class 2.00nos @350.00,semi skilled labour 2.00nos @300.00,overhead charges 7.50%,contactors profit 7.50%
{2}Rcc foundation ,plinth bands and footing bases of columns mss concrete pre cast slabs
1.Materials
Planks 0.267cum@17989,80mm dia non sal bullah 12.60meter @44
Considering 10times use of materials,for use once
2.Labour
Carpenter 2nd class 0.50nos @350.00,semi skilled labour 0.50nos @300.00,overhead charges 7.50% and contractors profit 7.50%
{3}RCC walls and fins including attached pilasters
1.materials
Planks 0.954cum@17989,non sal wood scantling 0.269cum@17989,120mm dia non sal bullah 100.8meter@66.00

Considering 10times use of materials ,for use once
2.Labour
Carpenter 2nd class 13.50nos @ 350.00,semi skilled labour 13.50nos @300.00,overhead charges 7.50% and contractors profit 7.50%.

IV. CONCLUSION

The wastewater from the GITA institutions was treated using the entire treatment process inside the campus itself .The waste water from GITA can be utilized for the agricultural purposes.The entire estimation of the plant is calculated ,according to the plan the entire plant was constructed for the treatment.Initially the characteristics of the waste-water was identified then it was allowed to be treated .As BOD and COD value was quite higher in the waste water indicates its polluted nature and dissolved oxygen in waste-water was recorded low value due to higher organic matter,BOD and COD.

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AUTHORS PROFILE

Payal Maharathi, completed bachelors degree in civil department from BPUT university and masters degree in environmental engineering from srmist Chennai. Research area is water and waste water treatment.