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Sewage Water Treatment Plant for Hingna

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Abstract: A sewage water treatment plant is necessary to receive and treat waste water (Domestic, Commercial, and Industrial). Its objective is to be convert harmful waste water to safe water environmentally and treated effluent and treated sludge suitable for reuse and disposal such as farm fertilizer. The characteristics of waste water have been performed followed by design of sewage treatment plant. The present study includes design of sewage treatment plant and analysis of waste water – PH value, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Solids (TS), Hardness, Chloride, Acidity, Oil, Fats and grease etc. The sample collection of waste water has been done in many times in a day to obtain an average value of major parameter. Followed by values of this parameter, calculations are done for designing the units of sewage treatment plant and layout is prepared for the same

I. INTRODUCTION

Sewage is harmful for public health and environment; it is a major carrier of disease. Sewage also pollutes the water bodies that cause a waterborne disease. Sewage is mainly generated from Domestic, Industrial and commercial zones and it's need to treated before depositing into water bodies so sewage must be processed in Sewage treatment plant –Sewage treatment plant it is a plan that removes contaminants from sewage and wastewater and makes safe fluid to dispose or reuse. It's includes physical, chemical and biological processes to remove physical, chemical and biological impurities. The objective of treatment plant is to produce disposable fluid without causing harm to surrounding. The sludge produced from treatment plan it can be used for farm fertilizer. Sewage treatment plant is a human need to ensure the safety of public health and nature. The current study comprises the study on domestic, commercial and industrial wastewater. The study includes parameters test for pH value, turbidity, BOD, COD, acidity, alkalinity, chloride, etc. Depending upon the value of all parameters, calculations are done for design different units of sewage treatment plant which has the capacity of 22.67MLD. The preliminary layout is prepared for same.

II. LITERATUREREVIEW

Sewage treatment is the process of removing contaminants and impurities from wastewater, mainly from domestic, industrial and commercial sewage . It sewage treatment processes includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated. A by-product of sewage treatment is called sludge and it can be disposed off or used for farm fertilizer. But before disposing the sludge it must be treated. The main objective of sewage treatment is to reduce the contaminants and polluting substances from sewage by the following the Central Pollution Control Boards (CPCB) Norms.

Effluent discharged standards for Sewage Treatment Plant:

TABLE: -1

Parameter	Existing general effluent standards (CPCB)	Standards for new STPs (CPCB)
BOD, mg/L	30	Not more than 10
Total Suspended Solid, mg/L	100	Not more than 20
COD, mg/L	250	Not more than 50
pH	5.5 – 9	6.5 – 9.0
Total Nitrogen mg/L	100	Not more than 10
Faecal Coli forms MPN/100mL	Not specified	Less than 100

III. OBSERVATIONS

As the results of raw sewage i.e. TSS, OIL & GREASE, BOD are exceeding from their permissible values. Hence, further treatment of raw sewage is required before its disposal into surface streams.

Sr. No.	Parameter	Calculated Value	Permissible Limits
1	PH	7.125	60.80
2	TDS	200 mg/l	< 100 mg/l
3	BOD	250 mg/l	< 30 mg/l
4	COD	500 mg/l	< 250 mg/l
5	Free Ammonia	35 mg/l	< 50 mg/l
6	Chloride	120 mg/l	< 600 mg/l
7	Oil and Grease	15 mg/l	< 10 mg/l

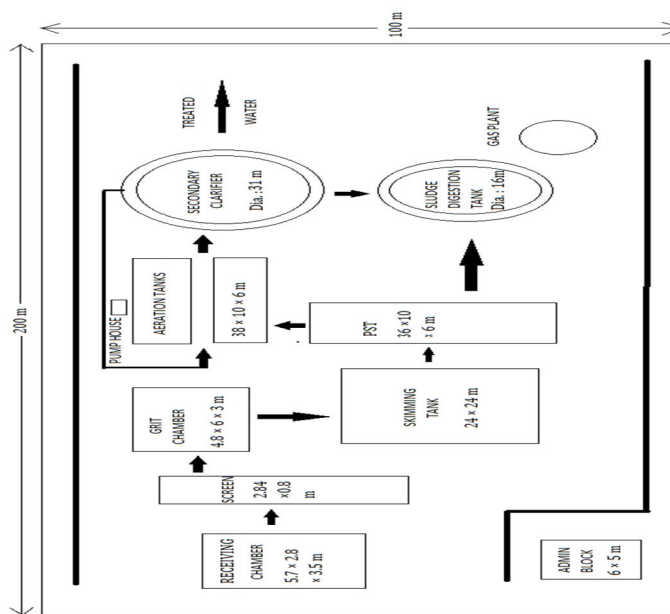
IV. RESULT

After following the designing procedure, the size of different treatment units required areas follow

- A. SIZE OF SCREEN- 2.84 m x 0.8 m
- B. SIZE OF GRIT CHAMBER -4.8 m x 6 m x3 m
- C. SIZE OF SKIMMING TANK- 24m x 24 m
- D. SIZE OF PST - 36m x 10m x 6m
- E. SIZE OF AERATION TANK- 38 m x 20 m x 5.5 m
- F. SIZE OF AERATOR-10 GENERATORS OF 30 HP
- G. SIZE OF SECONDARY CLARIFIER - DIA 31m with 5.5 m Depth
- H. SIZE OF SLUDGE DIGESTION TANK – Diameter 16m with 6m Depth
- I. GAS PRODUCED FROM DIGESTION TANK–1671.003 cu. M

As These Parameters Are Coming Within Specified Range Hence, The Design Is Okay

V. LAYOUT



LAYOUT OF SEWAGE WATER TREATMENT PLANT



VI. FUTURE SCOPE

The need of sewage treatment plant is increasing day by day. Today STP is seen as processing the effluent discharging into water bodies to avoid toxic and health hazardous in surface water. Due to climate change the future scope must be put on quantity and quality of effluent. STP is providing resources to environmental and for human activities.

A. STPs is Focused on

- 1) Wastewater treatment
- 2) Pathogens removal
- 3) Nutrient removal
- 4) Sludge disposal
- 5) Water reuse, etc

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