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DESIGN OF SEWAGE TREATMENT PLANT FOR LOHEGAON VILLAGE, PUNE

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Abstract: *This project is dedicated Lohegaon Grampanchayat. we are observe that the village is very big and the population of that village is 41476 nos. already there has existing sewage drainage network it carried sewage at other sewage treatment plant for Lohegaon and solve the social and environmental pollution issue due to sewage is disposed some part of village people directly sewage drain on open land. It rise the environmental pollution.in this village produce whole sewage quantity peak flow 45MLD.*

We are design the STP plant on the basis of activated sludge process. It is aerobic process to digest sewage very quickly compare with anaerobic process and the effluent generate from STP directly disposed into the nallah or stream near sant nagar we select that location for construct STP plant the sewage is use for landfilling and as fertilizer spread over land.

Key Words: *Sewage, Dissolved Oxygen, Biological oxygen demand, chemical oxygen demand, PH, Total solid*

1. INTRODUCTION

With the march of civilization and the growing social consciousness of the communities in the country, there has been an incessant demand for doing away with the existing dry latrines and replacing the same with sanitary water seal latrines. Further, other liquid wastes generated by the communities are now carried in open drains leading to severe environmental problems. To dispose of these liquid wastes in a proper and sanitary manner, it would be necessary to collect them in a system of sewers.

The sewage thus collected has perforce to be disposed of in a body of water, like stream, river, lake or sea. However, proper care has to be ensured that it does not interfere with the other uses of these water bodies, like water supply, recreation, etc. Pollution caused by sewage is perhaps more important from the point of view of the health of the community as it contains a number of causative agents for many dangerous diseases, which can easily spread through the water supply systems.

The concern for crying a halt to the menace of pollution of our water environment before it reaches unmanageable proportions has already culminated in the enactment of the Central legislation "Water (Prevention and Control of Pollution) Act, 1974". The most logical solution to arrest the deterioration of the environment lies in the provision of appropriate and adequate treatment facilities for the sewage

2. RELATED WORK

1. **Data collection from Lohgaon Grampanchayat:**
   Such as previous population record from year 1981 to 2011.Water demand quantity liter per day / per capita is 120l/p/d (liter per day).Existing sewage network plan.
2. **Collect 3 bottles of 1000ml sewage sample**
3. **Laboratory test result:**

Name of test	Influent	Effluent
BOD 20`c	295mg/l	20mg/l
Total suspended solid	4653mg/l	30mg/l
PH	7.5	7.5
DO	6.16mg/l	Least 4 mg/l

Table 1. Laboratory Test Result

4. **Design of Sewage treatment Plant**

   1. *Population of village after 30 years=41476 nos*
   2. *Sewage quantity as per IS code*

      Avgflow of sewage =4.23MLD

      Peak flow of sewage =4.56ML

      Dimensions of unit process(L*B*D) in m

   3. *Primary treatment*
      a) Bar screen= (2*0.65*0.4)
      b) Grit chamber 2nos: dia= 2.0, depth=1.3
   4. *Primary clarifier*
      Dimension = 36*5.5.2m
   5. *Aeration tank 2nos*
      (L*B*D)=(36*15*4.5) in m.
   6. *Mechanical aerator 6nos*
   7. *Secondary clarifier*
      Dia= 13m, depth= 3.8m
   8. *Drying bed 4nos*
      (L*B*D) in m= (7*1.2*0.9) m

5. Design results

Sr. No.		Name Of Unit	Nos	Length (M)	Width (M)	Height (M)	Dia (M)
1		**A. Primary treat process**					
	1	Bar screen	2	0.65	0.42	0.4	-
	2	Grit chamber	2	-	-	1.3	2
	3	Sedimentation tank	1	36	5.5	2	-
2		**B. Secondary treat process**					
	1	Aeration tank	2	35	15	3.5	-
	2	Secondary clarifier	1	-	-	3.8	13
	3	Drying bed	4	-	-	2	2.5

Table 2. Dimension of STP unit

3. CASE STUDY

Nesapakkam Sewage Treatment Plant

The Chennai city sewerage system has been divided into five zones. Each zone has been provided with individual collection areas, pumping stations, force mains etc. Nesapakkam Sewage Treatment Plant is located on the western part of city and receives the sewage collected from zone 4, covering the areas like Saidapet, West-mambalam, Ashoknagar, M.G.R Nagar, K.K.Nagar, Thirunagar etc,. The plant was commissioned in 1974which is the first sewage treatment plant in Chennai. The plant is designed to cater for an average flow of 23 MLD(million liters per day) with a peak factor of 2.67.

4. DIMENSIONS AND SPECIFICATIONS OF THE TREATMENT UNITS

Inlet chamber: Inlet chamber is a rectangular tank with 2 m x 3 m sides and 6 m depth.

Screen Chamber: Screen chamber is provided with manually cleaned bar rack of medium size. Width of the screen chamber is 2.41m and depth is 1.37 m. The bars are rectangular sharp edged ones having 6 mm thickness at clear spacing of 25 mm.

Detritus Tank: Side of the square detritus tank is 10m and Side Water Depth is 1.0 m

Primary Clarifier: There are two identical circular primary clarifiers with 21.4 m diameter and 2.4 m side water depth in each.

Aeration Tanks: Three numbers of aeration tank (Fig 4.5) of 40 m length, 10 m width and 3.8 m depth each are provided. The system is provided with 12 numbers of fixed aerators having a capacity of 12.5 HP each. The flow in the aeration system is in completely mixed flow regime.

Secondary clarifiers: There are two identical secondary sedimentation tanks (SST), having 24.5 meter diameter and3.1m side water depth, each.

Primary and secondary digesters: The primary as well as secondary digesters are having 21.4 m diameter and6.1 m side water depth.

5. FUTURE WORK

In Urban cities where source of waste water is limited is necessary reused to treated waste water in fact inmost of commercial establishment it is mandatory to use treated sewage water in flushing gardening and cooling tower when any sewage treated waste water is being reclaimed for non-potable use expected, quality of treated water is very high it is expected to be free for microorganism, color & odour, so in this situation where high quality of STP treated water is expected OZON technology become most effective and efficient.

6. CONCLUSION AND EXPECTED RESULT

1. Design of Sewage treatment plant (STP), is highly effected by the population density, population growth and period of broadcasting.

2. Design parameters should be carefully considered for each part of the (STP).

3. In this project the population density used was "41476" capita ,which resulted in large and added basins were used.

4. In addition to physical , chemical , and biological treatment processes , there is an treatment used to remove those constituents , that are not adequately removed by the conventional methods of treatment and the produced water can be used for recharging subsurface water level at lohegaon and irrigation purpose .

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