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PACKAGE SEWAGE TREATMENT PLANT

Process Description :-

We have adopted the most modern treatment of Sequential *Batch Reactor (SBR) Process*.

This option is worked out on the basis of quantum of flow available to treat and suitability of the treatment on the basis of following objectives

1. Simplicity in construction and operation.
2. As the process is entirely aerobic, primary settling of wastewater and the anaerobic digestion of the sludge are omitted.
3. Aeration and secondary settling are carried out in batches, thus mineralizing the sludge solids sufficiently so that they can be dewatered without any digestion. This in turn will improve the overall efficiency and simplify the whole operation.
4. The BOD removal efficiency is higher than any conventional Activated Sludge Process; even to the range of 97-98% which itself is very good by any standards. In case for further treating the liquid by tertiary treatment large amount can be saved due to very less impurities in inlet water to tertiary treatment unit, which makes it especially desirable to use where it is to be followed by Tertiary Treatment for reuse.
5. The space requirement is comparatively less than any other conventional treatment.
6. The plant as constructed / fabricated will be fully automatic in nature will result in easy operation ensuring high efficiency and minimum manpower requirement.

The actual scheme of treatment will start from screen chamber ahead of raw sewage collection sump. The raw sewage as received undergoes coarse screening through manual screen. The necessary isolation gate (if required) is provided at the upstream of the screen chambers to facilitate the maintenance of the screen. The flow from the screen chambers after screening is then collected in raw sewage sump. The pumps are Submersible Non Clog type



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with Solid Handling Size more than 40 mm with necessary level controllers. Raw sewage will be

Then conveyed through suitable size rising main to the Package Sewage Treatment Plant.

The schematic representation and sequence of treatment includes

- Receipt of raw Sewage
- Raw sewage to sump
- Removal of floating material
- Biological waste water treatment in Bioreactor

The excellent quality of water discharge at outlet enables the same to be used for gardening, flushing, car washing or any other purpose than human consumption.

The Treatment Units

The screened sewage received into Raw Sewage Sump is delivered to Batch reactor for biological treatment.

Process:

The package plant is designed with Activated Sludge Process, More precisely Advanced Aeration Process. In this system raw sewage after removing floating material is allowed to enter in to Biological reactor where adequate quantity of oxygen is introduced to develop aerobic bacteria's who in turn help in the waste water. The Biological Process of Sequential Batch Reactor (SBR) technology will commence in single Reactor comprising of 3 basins. The flow from raw sewage sump after screening will be received in these reactor/basins in predetermined sequences of cycles such as Fill & Overflow, Aerate & Settle. It will work with sequence of fill & overflow, aeration and settling phases controlled by PLC.



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Each cycle consists of following combined phases.

- **FILL/OVERFLOW**
- **AERATE**
- **SETTLE**

Explanation of sequencing operation

These phases in a sequence are repeated. During the period of treatment, the liquid volume inside the tank and the liquid level in the tank remains unchanged at all times. In the 'F/O' phase filling of a compartment starts. The raw sewage enters to settling / Aeration zone from bottom.

On completion of F/O phase, 'A' phase will start. During this phase air will be supplied by air compressor, which will pass through Disc type diffusers fitted at bottom of tank. Thus Aeration phase will provide adequate aeration required for biological reaction

In **SETTLE** aerated sewage will be allowed to settle so that supernatant will become clear water.

The supernatant is collected in the launder constructed at appropriate location & it will flow for further storage. Arrangements are made to remove Excess Activated Sludge (EAS) from relevant basins. The Excess Activated sludge will flow in specially designed sludge dewatering device to save on large space required for Sludge Drying Bed. The dewatered sludge can be used as good manure cum soil conditioner.

The supernatant from the **plant** will be collected into Chlorine Contact Tank / storage tank (OPTIONAL) through launder where required dose of Sodium Hypo chloride Solution will be given for disinfections. Further the disinfected effluent will be collected in to the tank for further use as flushing water, gardening etc. **All the process in Reactor basin will be automatic.**



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