A.E.E.

Akiki Engineering Est.

Water & Steam Experts

3.1. Wastewater Treatment Catalogue

October 7, 2010

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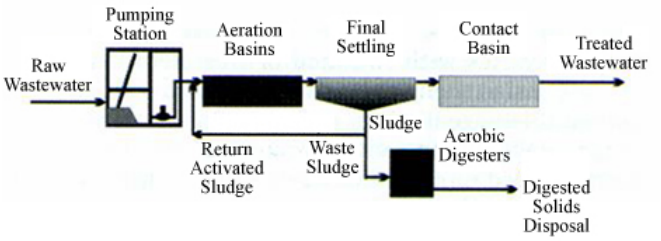
Rectangular Plant, Extended Aeration



This type of physical-biological process is effective in reducing the organic content of wastewater and accomplishes the major objective of BOD and suspended solids removal.
The extended aeration activated - sludge process is commonly used to treat small wastewater plants from schools, subdivisions and villages.
The purpose is to control the decomposition of the organic material in the presence of air with a minimum of time and provide an acceptable effluent.
This type is furnished with hopper-type clarifier.

Options:

- The units may be concrete built in place or steel tank fabricated in factory.

Aeration Tank

- Continuous complete mixing is done by diffused air. Aeration period is 24 hr.

Clarifier or Settling Tank

- The liquid and solids flow into the clarifier through a submerged inlet pipe. The settled sludge is returned to the aeration tank to maintain a sufficient quantity of solids in the aeration system or to the sludge holding tank for the purpose of wasting when there is an excess amount of solids in the aeration tank.
- Disposable is done through a submersible pump located at the bottom of the hopper type tank.

Sludge Holding Tank or Aerobic Digester

- Sludge is removed from the settling tank and discharged into the sludge holding tank. In this manner, the solids concentration in the aeration tank is controlled.

Chlorination Contact Tank

- The clear treated effluent from the clarifier (settling tank) flows into the chlorine contact chamber for final. Chlorine is fed continuously to the chlorine contact chamber. Applications of 8 to 15 mg/l provide adequate disinfection with a contact time of 30 min.

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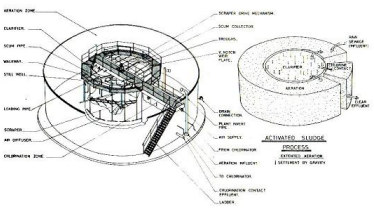
Circular Plant, Extended Aeration



This type of physical-biological process is effective in reducing the organic content of wastewater and accomplishes the major objective of BOD and suspended solids removal.
The circular extended aeration activated - sludge process is commonly used to treat large divisions, housing developments, hospitals, industries, schools, villages, hotels, camps, and food processing factories.
The purpose is to control the decomposition of the organic material in the presence of air with a minimum of time and provide an acceptable effluent.
The principal structure shall consist of two concentric steel tanks forming an inner chamber and outer annulus. The inner chamber shall be used as a clarifier or settling tank. The outer annulus shall be divided into compartments to form aeration chamber and chlorine contact chamber.

Aeration Tank

- Continuous complete mixing is done by diffused air. Aeration period is 24 hr.

Clarifier or Settling Tank

- The liquid and solids flow into the clarifier through a submerged inlet pipe. The settled sludge is returned to the aeration tank to maintain a sufficient quantity of solids in the aeration system or to the aerobic digestion tank for the purpose of wasting when there is an excess amount of solids in the aeration tank.
- Disposable is done through a submersible pump located at the bottom of the circular clarifier.

Aerobic Digester

- Sludge is removed from the settling tank and discharged into the sludge holding tank. In this manner, the solids concentration in the aeration tank is controlled.
- Sludge is removed from the settling tank and discharged into the aerobic digester. In this manner, the solids concentration in the aeration tank is controlled.

Chlorination Contact Tank

- The clear treated effluent from the clarifier (settling tank) flows into the chlorine contact chamber for final. Chlorine is fed continuously to the chlorine contact chamber. Applications of 8 to 15 mg/l provide adequate disinfection with a contact time of 30 min.

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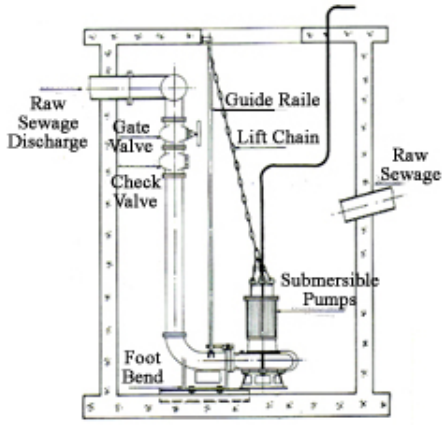
Lift Station



There shall be furnished and installed a complete AEE lift station unit with all equipments and accessories that may accomplish a pumping capacity as shown in the table.
The major items of equipments shall include: Tank steel structure or concrete, internal piping and valves, two non-clog centrifugal sewage pumps(one of which is for stand-by), float switches, and all other items required to provide a complete lift station as specified herein.

Test Options:

- The completed lift station shall be given a running test of the equipment where possible, to check for excessive vibration; for leaks in all piping; for correct operation of the control system; and of all auxiliary equipment. The station suction and discharge lines shall be connected to a reservoir and the station shall recirculate the water, simulating actual service conditions. The automatic control shall be adjusted under such operating conditions to start and stop the pumps at approximately the levels required by the job conditions.

Construction

- The lift station housing shall be constructed of carbon steel (fabricated in factory) or concrete (built in place) with specified length and width.
- The base and cover plates shall be constructed of steel plate to cover the lift station ends.
- The cover plate shall have a manhole to allow maintenance of the station. The station tank shall be structurally designed to withstand internal stress imposed by sewage level under normal operating conditions, and to withstand the hydrostatic pressure normally encountered in underground installations. A guide rail shall be installed vertically to permit removal of pumps for maintenance purposes.

Pumps

- There shall be furnished and installed a non-clog self-priming centrifugal submersible sewage equal pumps, specifically designed for handling raw, unscreened sewage.

Piping

- The station shall be furnished with all necessary interior pipes, fittings and valves.

Welding

- All steel structural members shall be joined by electrical arc welding with fillets of adequate section for the involved diameter. Such welds shall be continuous and water tight to exclude ground water. All inserts for pipes shall be welded inside and out. The suction and discharge lines shall be reinforced where they pass through the station walls with steel sleeves welded inside and out, or above grade for easier access. The space between the pipes and the steel sleeves shall be packed tight with expanding cement grout to prevent leakage.
- In operation, when liquid level reaches the lowest float switch, the holding contact is closed and the alternator is energized. Upon further rise of the liquid level in the lift station, the second float switch opens; the alternator will be de-energized, thus alternating the lead pump.
- If the level continues to rise with the lead pump in operation, a third float switch shall close. This will start the second or the lag pump. The lead and lag pumps shall then pump down to the level of the lowest float switch at which point both pumps shall stop.

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