

Technical specifications

The raw wastewater is entered to Manual coarse screen with 50mm bar space and mechanical screen with bar space 20 mm. one Manual screen bar space 20 mm is considered as mechanical screen stand by. The screens are compacted and transferred to rubbish mobile container through belt conveyor.

The screened wastewater is entered to wastewater pump station by concrete channel and then is pumped to DAF system. DAF systems are designed to remove suspended solids, BOD, and oils and greases from a wastewater stream. Contaminants are removed through the use of a dissolved air-in-water solution produced by injecting air under pressure into a recycle stream of clarified DAF effluent. This recycle stream is then combined and mixed with incoming wastewater in an internal contact chamber where the dissolved air comes out of solution in the form of micron-sized bubbles that attach to the contaminants. The bubbles and contaminants rise to the surface and form a floating bed of material that is removed by a surface skimmer into an internal hopper and then is pumped to classifier. Each grit chamber can be isolated by grit chamber inlet sluice gate. Dissolved air flotation effluent is entered to equalization tank equipped by vertical mixer (Hyperboloid mixer) in order to blend the content of tank and prevent deposition of solids in basin and also submersible pumps for transferring equalized wastewater to the next unit (Upflow anaerobic baffled reactor). An upflow anaerobic baffled reactor is an improved septic tank with a series of baffles under which the wastewater is forced to flow. The increased contact time with the active biomass (sludge) results in improved treatment.

The selected aerobic biological process is sequencing batch reactor (SBR). SBR process is a batch· fill and draw activated sludge treatment process. It involves a treatment sequence of fill, react, settling, supernatant decanting, and idle. Activated sludge aeration and liquid solids separation occurs in the same tank. Wastewater is carried to a channel that discharges it into SBR distribution box for its distribution to the 4 SBR reactors. The adopted aeration system is diffused aeration with fine bubble diffusers and SBR blowers. SBR distribution box is equipped by SBR distribution inlet penstocks for isolation of each SBR tank. Each SBR tank is equipped with three Hyperboloid mixers and two submersible pumps for transferring sludge to aerobic digester tank.

Sequencing batch reactor tanks are equipped with SBR tank decanters. The floating decanter is a decanter unit properly designed for SBR, that allows to discharge settled water from the tank. Decanted wastewater is transferred to chlorination contact tank for chlorination by concrete channel. The flow rate is measured by Outlet parshall flume before entering to chlorination contact time.

The effluent disinfection is conducted with addition of chlorine gas as disinfectant agent. Chlorine contact tanks provide required contact time between wastewater and chlorine solution for effective disinfection. Disinfected wastewater is transferred to treated wastewater storage tank and then is pumped to river and some part of them is pumped by treated wastewater pump for service water.

Some part of digested sludge is pumped to upflow anaerobic baffled reactor unit inlet channel by submersible digester sludge pump and wasted activated sludge is transferred by belt filter press feed pumps to combined Belt filter press (drum thickener +belt filter press).

Drum thickener where the sludge/polymer mixing takes place and the water coming from suspended particles is drained away through the drum outer filtering cloth. The sludge discharged by the pre-dewatering drum is distributed on the cloth. In the first phase the sludge is dewatered by gravity. In this way it is possible to obtain concentrations more and more increasing before getting to the precompression phase. Dewatering unit supernatant (Combined belt filter press+ drying bed) is transferred to inlet water pump station by gravity.