

BRIEF DESCRIPTION OF MOUNTAIN WATER TREATMENT PLANT

Date: 17-01-2018

1 BASIC'S

- The treatment system is designed for a maximum flow of 100 l / s and a maximum total suspended solid rate of 300 mg.
- Contaminants of concern are suspended solids.
- Compact system of plant due to constrained space available.
- Reliable and proven system.
- Easy installation, operation and maintenance.
- Sediments deposited will be removed and stored in a suitable place for appropriate disposal.

2 TECHNICAL DESCRIPTION

2.1 TREATMENT SYSTEM:

The treatment system consists of a sequence of processes within the above noted parameters.

- The processing steps are as follows:

1) Flocculation (chemical conditioning): The system uses a dosing system for pH correction.

2) Sedimentation: With compact clarifier - lamella type.

2.2 FLOCCULATION:

The main objective is to allow chemical flocculation of the particles to allow their treatment and mixed with the effluent in line.

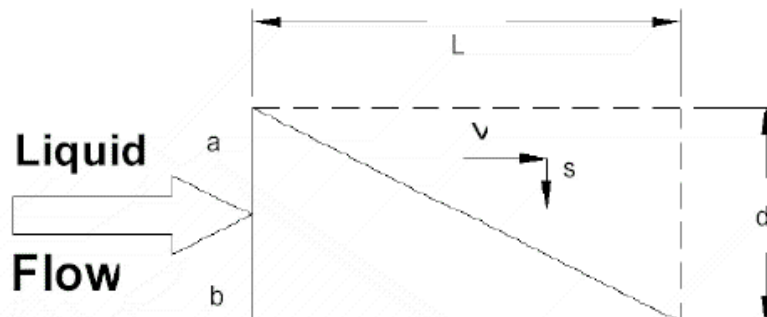
2.3 SEDIMENTATION:

It is a system that uses the principle of settling for separating solids from a liquid. It is characterized as the compact type, i.e., performs the process at a space from a third to a sixth time smaller than a conventional clarifier. The solids settle to the inclined plates and gravity slide the conical bottom.

A gravity clarifier allows a easier removal of solids from liquids method's, because gravity is a free source of natural energy. A simple clarifier provides a non-turbulent zone where the solids suspended in the liquid are given enough time to settle on the plates and slide the bottom time.

2.3.1 OPERATING PRINCIPLES OF COMPACT CLARIFIER:

A particle entrained by the speed of the liquid, should stand long enough to settle so that trip to the bottom of the system, before being dragged back and expelled by the natural flow of water (to the surface). Thus, particles must start at point "a", must cross somewhere between 'ab' and 'ab' to avoid being dragged to the surface. Somewhere between 'ab' and 'ab' to avoid being dragged to the surface.



If V is the horizontal velocity of the fluid , S is the sedimentation rate of the solid particle , L is the length of the sedimentation device, and D is the depth . Intone particles entering the point A will settle to the bottom of the mechanism, only if V is not exceeded : $S (L / D)$

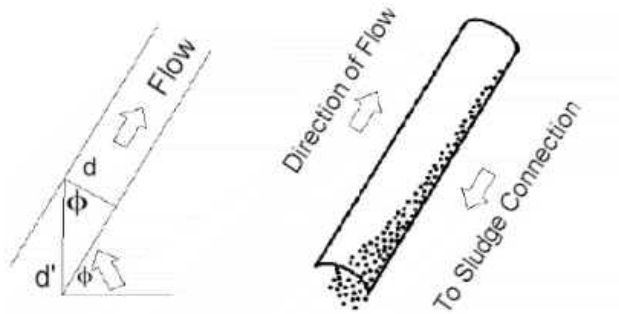
$$\text{Since } V_{\max} / S = L / D \text{ then , } V_{\max} = S (L / D)$$

Therefore, the speed at which a horizontal clarification mechanism may operate satisfactorily , it is directly proportional to its length and inversely proportional to its depth.

This analysis applies to many units horizontal clarification. The space between the plates is usually a few inches, as opposed to the depth that several opposed to the total depth of the tank meters. Thus , sedimentation is dramatically reduced , the flow must also be non-turbulent to prevent solids again be dragged to the surface by the liquid in motion.

The horizontal clarification itself performs self-cleaning because the plates are inclined at such an angle that exceeds the angle of repose of the solids. The flow of water without turbulence and enter the end portion of said plates , the solids will settle on the plates and slide to the bottom of the tank , achieving an efficient clarification

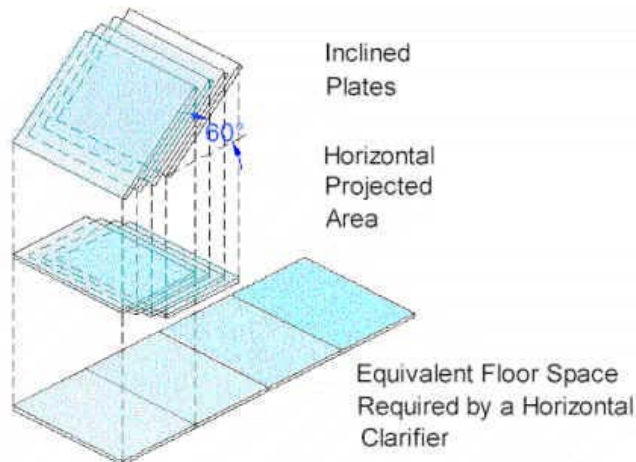
However, when these plates are inclined at greater angles , the sedimentary particles not lie more in the distance D , but the greater the distance D' . This new sedimentation distance D' is related to D by the relation : $D = D' \cos$



Theta "f" es el ángulo, el mecanismo es inclinado en un plano horizontal. Así, la distancia de sedimentación se incrementa por el factor: $1/\cos f$, en donde $f = 60^\circ$, $1/\cos f = 2$

2.3.2 INCLINED PLATES:

A further space reduction is acquired by decreasing the separations between the plates to only leave space to permit the accumulation of solids settling and does not cause clogging. By tilting enough to that of the automatic cleaning, 45° for heavy particles and light particles 60° to the horizontal projected area equivalent to the cosine of the angle factor decreases.



2.3.3 SEDIMENTATION:

The sedimentation rate for specific solid can be determined by simple laboratory tests. Light particles, such as metal hydroxides, usually require a parameter of 0.5 m³/h per m² horizontal projected area. This low density of solids required inclined plates are placed at a minimum angle of 55° , to induce the particles to slip and fall to the bottom. Heavier particles, such as sand, can slip seamlessly from an angle of 45° .