



## **CIRCULAR GRAVITY CLARIFIER PRODUCT BULLETIN**

### **General Description**

One 20-ft diameter by 12-ft sidewater depth clarifier shall be carbon steel construction with immersion duty epoxy coatings. This circular gravity clarifier has 314 sq. ft. settling area and is rated at 876 gpd/ft<sup>2</sup> at the design flow of 191 gpm (275,000 GPD). The clarifier is conservatively designed to handle high sludge volumes (for future MLSS) with the 12 feet working depth provided. The total capacity of the 20 ft diameter by 12' water depth unit is 28,185 gallons for a 147 minutes max. theoretical detention time.

The polymer flocculant which may be needed to enhance the TSS settling rate and effluent quality can be fed into the externally mounted rapid mix (100



**Flocculation. Tank & Clarifier**

center flocculation mixing chamber be employed the floating solids would be trapped inside the center chamber wall.

The wastewater flows from the externally mounted flocculation tank into the clarifier center well (stilling chamber) for even flow distribution into the center of the clarifier. The settling solids drop to the sludge blanket and are removed with the rake mechanism. Radial flow of the clarified water is to the circumferentially mounted V notched effluent weir. This circular weir is at the top of clarifier main body wall, at a 20ft diameter. This provides a very conservative overflow rate of 4379 gpd/ linear foot of weir.



**Photo of Typical Clarifier**

gallon) and slow mix (1000 gallon flocculation) tanks. These tanks are elevated for gravity flow into the clarifier. The tanks provide for excellent mixing conditions necessary to optimize the coagulation and/or flocculation processes.

The mixing tanks are externally mounted so that the clarifier surface skimming system will be able to remove floating TSS from the entire clarifier surface. Should a typical clarifier



**Flocculation Tank**

### **Surface Skimmer Description**

A surface skimming device rotates with the sludge rake drive shaft and collects floating mater into a hopper box. One 18 ft diameter baffle of HDPE shall be installed inside the effluent overflow weir to hold back floating mater for removal with the skimmer. The hopper box discharges via gravity to an outlet pipe with a side wall mounted flange. The air operated sludge pump is to be transfer collected solids to the sludge tank. This pump will be operated automatically based upon a timer setting in the PLC program. The skimmer and wiper shall be stainless and HDPE construction. The collection hopper shall be ¼" carbon steel plate with epoxy coating. One 18 ft diameter baffle of HDPE shall be installed inside the effluent overflow weir to hold back floating mater for removal with the skimmer.



**Sludge Rake**

### **Sludge Rake Description**

The sludge blanket is slowly moved to a center sludge sump by a sludge rake mechanism. The gentle rake action promotes the sludge thickening process by gently pushing the sludge to the center sump thereby forming pathways for the solids to compact and water to escape. One 3" flanged fitting on the sludge sump will be piped to a 2" cast iron air operated sludge pump. This pump will be operated automatically based upon a timer setting in the PLC program

The sludge plows shall be stainless with HDPE squeegee construction. All fasteners shall be stainless. The main shaft and structural arms shall be carbon steel construction with immersion duty epoxy coatings

The clarifier has one side manway for ease of access during shutdown maintenance periods.

### **Bridge and Drive Description**

The sludge rake drive (0.25 HP) is mounted to the top bridge. This drive unit consists of a motor driven reducer, powered by a 1/2 hp, 3 phase, 60 Hertz, 230/460 volt, totally enclosed, fan cooled motor which revolves the sludge scraper shaft through a pinion and spur gear placed beneath the bridge floor. Connected to the driving shaft are two fabricated steel sludge scraper arms with steel plows and adjustable steel squeegees. Drive assembly is protected by shear pin for excessive torque. A 3-ft wide checkered steel plate walkway is part of the clarifier bridge assembly and allows for the operator to service the drive and observe the clarifier. The bridge walkway is surrounded with 42" high double-row hand- rails made of 1.5" tubular steel. A stairway to the bridge



**Effluent Weir & Floating Sludge Hopper**

is included. The overall height to the top of the bridge handrails is 18 feet.