

Rota-Rake® Thickener



The Graver Rota-Rake® Thickener is a horizontal flow sedimentation and thickening unit for the efficient separation of suspended solids from liquids by gravity. Designed for maximum separation, positive sludge removal and complete overload protection, the Rota-Rake consists of:

1. Round or square tank with conical bottom, constructed of concrete or steel.
2. Quiescent-flow feed arrangement and overflow effluent collection system.
3. Positive sludge collection and discharge system including motor-driven scraper and conical central discharge sump in the bottom of the tank.

The Rota-Rake is available in a wide range of sizes and designs to fit the needs of every type of gravity separation application.

Advantages of the Rota-Rake® Thickener

- Wide range of types, models, sizes and torque-loading capacities
- Maximum clarification with quiescent-flow feed system, minimum turbulence
- Positive sludge removal with mechanical scraper, thickening sump and automatic blow-off control
- Submerged orifice plate or peripheral V-notch weir water collection system
- Positive overload protection with Protecta-Trol and optional hydraulic lifter
- Low initial cost, economical operation through low maintenance requirements, rugged long-life construction, simple design
- Ice design available for outdoor operation in colder climates
- Utilizes shop assembled, oil-bath lubricated drive package

Typical Applications:

- Municipal water
- Utility wastewater
- FGD purge streams
- Cooling tower blowdown
- Industrial wastewater
- Lime softener sludge
- Coagulation sludge

Rota-Rake® Thickener Models



Type MB

Bridge-supported design

Feed System

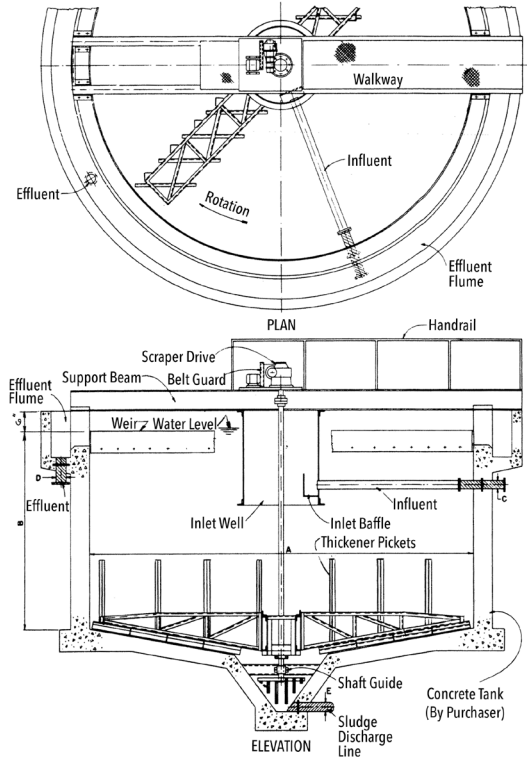
Water enters pipe to inlet well. The stream leaving the inlet pipe is split so that the two flows lose velocity by neutralizing each other for gentle introduction into the unit.

Collection Method

Submerged orifice plate collectors. V-notch overflow weir also available.

Vertical Pickets

With the addition of vertical pickets to the sludge scraper arms, thickening is enhanced. Moving through the sludge layer in the hindered settling zone, the pickets create open spaces in the compacted sludge, allowing water to rise to the top and sludge to fall to the bottom. Thus, maximum dewatering and thickening of the sludge is achieved.



Type HC

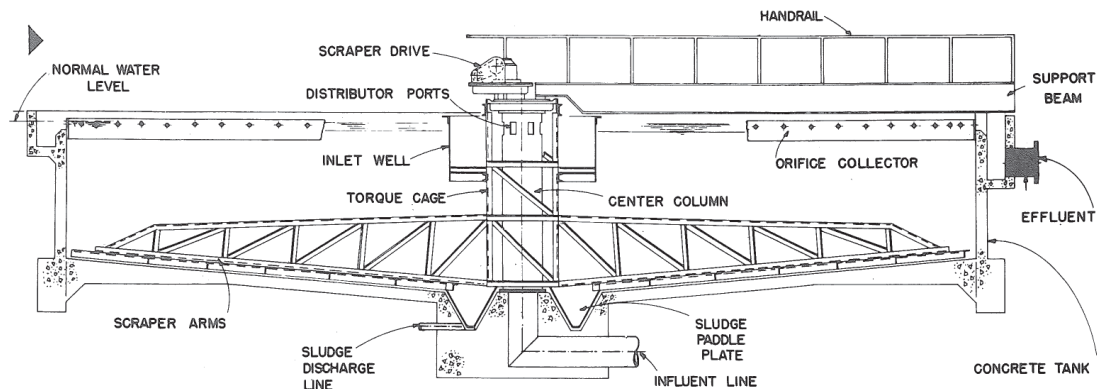
Heavy-duty center-post design for large diameter units when torque-loading is more than 20,000 ft.-lbs. Torque cage or tube is used as the transmission unit.

Feed System

Water enters bottom of center-post, rises to inlet well and flows out through ports in top of post, losing initial velocity.

Collection Method

Submerged orifice plate collectors. V-notch weir collectors also available.



Rota-Rake® Thickener Operation

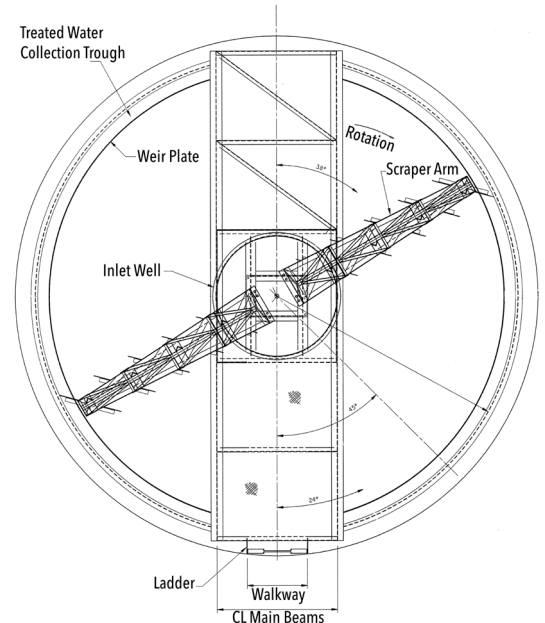


Sedimentation

In the Rota-Rake, the water is fed to a central inlet well and its velocity is reduced. Heavy solids are immediately deposited to the bottom of the tank. As the water flows evenly and gently out of the bottom of the inlet well and makes its way radially across the unit, the other solids settle out, the finest particles settling near the periphery where velocity is lowest. The water then flows into collecting launders.

Sludge Collection

The settled solids are collected by a heavy-duty sludge scraper that has a length of slightly less than the inside diameter of the tank. The scraper is designed to provide maximum positive removal with a minimum of agitation. It has blades that continuously scrape the settled solids toward the center area of the tank and into the sludge sump where the sludge is drawn off manually or automatically. A rotating paddle in the sump keeps the sludge moving and also thickens it further. On MB-style Rota-Rakes, the scraper arms in most cases are attached to a central shaft by means of a scraper hub that is supported by two beams across the top of the tank. Larger HC-style Rota-Rakes are provided with a center-post support; the scraper arms are connected to a torque tube or cage that is connected to the drive head. A skimmer attached to the scraper is provided when required.



Overload Protection

Full provision is made to protect the unit from overload damage. A Protecta-Trol indicator with contact for alarm and shut-off is provided with every unit. A hydraulic lifter for the sludge scraper is available where required.

Rota-Rake® Thickener Features

Submerged Orifice Plate Water Collection System

Collects clarified effluent four inches below the surface. As a result, its operation is unaffected by wind conditions across the unit and balance of flow is maintained at all times. Operation is also unaffected by freezing conditions or floating materials. The great advantage of this collection method is that it prevents short-circuiting and assures, on a consistent basis, full design detention time. This contributes to the maximum clarification achieved in the Rota-Rake. Effective V-notch weir collection systems can also be supplied whenever required.

Heavy-Duty Sludge Rake

Extreme strength and rigidity are provided throughout the rake mechanism. The rake arms rotate slowly and collect efficiently while producing little agitation. Mechanical and electrical overload protection features are standard.

Complete Sludge Collection System

Includes conical sump, rotating sludge thickener and automatic or manual blow-off equipment.

Protecta-Trol Indicator and Controller

Supplied as regular equipment on all Rota-Rakes. Protecta-Trol registers overload conditions, has alarm contact for light, bell or other signal and a contact to shut down unit in case of overload. Visual load indicator is in operation at all times. Unit is incorporated into the drive package.

Hydraulic Lifter

Available on Type MB units, can raise sludge scrapers 12 inches or more when heavy sludge prevents normal rotation. By collecting the top layer of sludge and working down, temporary overload can usually be eliminated. Lifter is activated by manual or motor-actuated hydraulic pump and valve system.

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