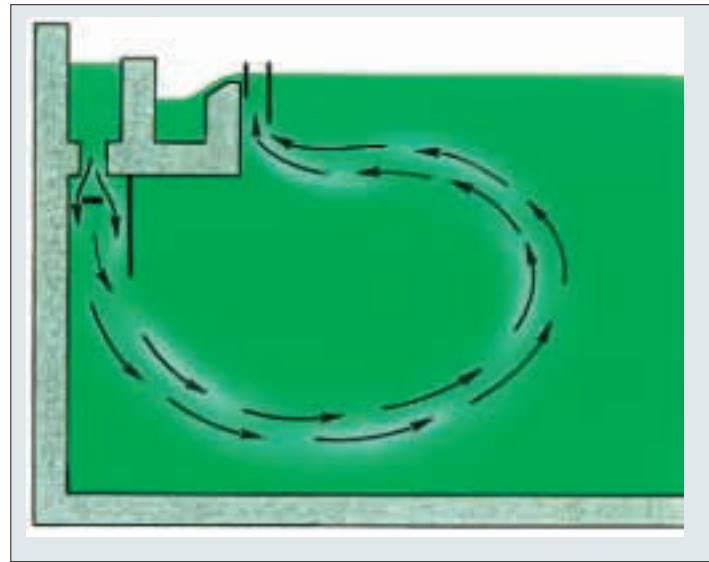




Rim-Flo[®] Clarifiers

Water Technologies

SIEMENS



Optimum hydraulic efficiency – maximum capacity

Rim-Flo® Clarifiers

Rim-Flo® Clarifiers A Proven Record

Rim-Flo® Clarifiers, the peripheral-feed, peripheral takeoff clarifiers originated by Siemens Water Technologies, have a proven record of performance in wastewater plants worldwide. Used as secondary activated sludge clarifiers in sewage treatment plants, they offer greater capacity, higher overflow rates, optimum hydraulic stability, full surface and feed channel skimming, maximum design versatility and lower construction costs.

Because of its greater hydraulic efficiency (50 to 80% more than center feed clarifiers) a Rim-Flo® Clarifier can be smaller than a center feed unit, or the extra capacity can be used as a conservative factor when designing treatment plants. Installed in existing clarifiers they provide the extra capacity needed to relieve overload situations.

Comparisons with Center Feed Clarifiers

A number of cost studies have been made comparing Rim-Flo® Clarifiers with center feed clarifiers. These studies demonstrate that there is little, if any, cost difference between the two types where tank dimensions are identical and all costs are included. The requirement for cantilevered effluent troughs and energy dissipating feedwells in the center feed design makes the Rim-Flo® Clarifier very cost-effective.

However, with the greater hydraulic loadings made possible with Rim-Flo® Clarifiers, smaller tanks often can be used. Thus land and construction costs can be substantially reduced. Less excavating is required. Siemens Water Technologies will be happy to show you cost comparison studies that have been made.

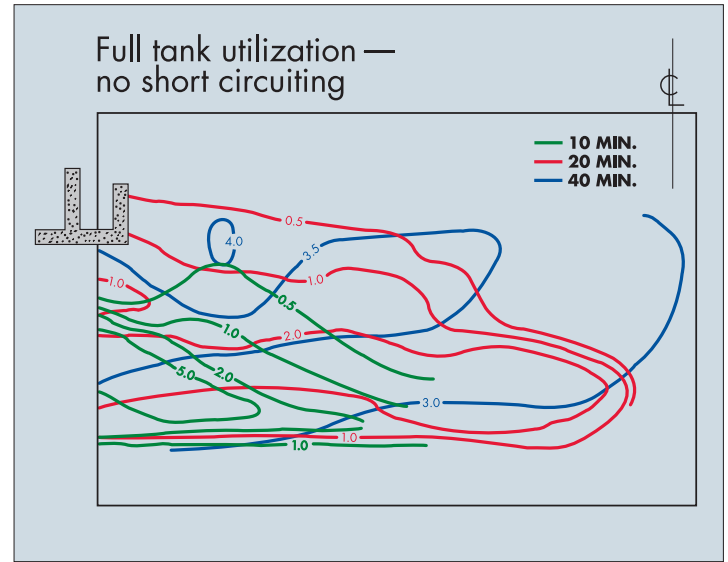
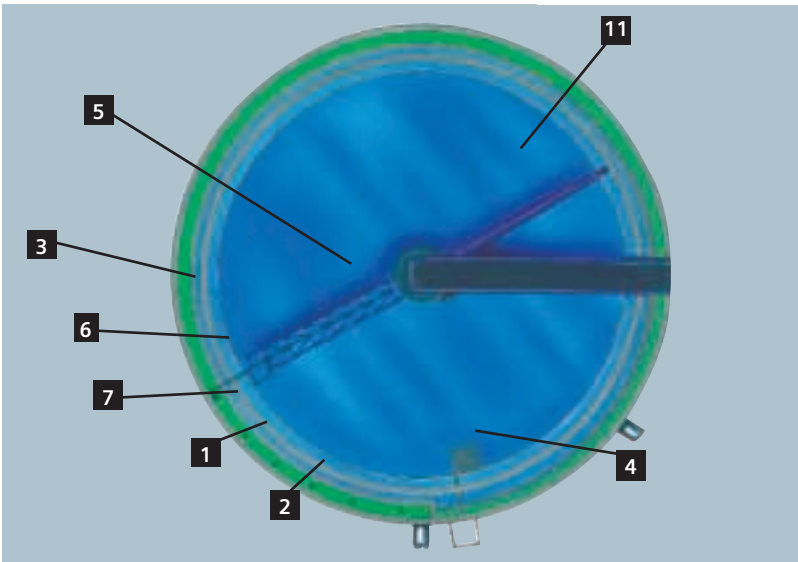
Check these Benefits.

Channels. Varied cross section maintains constant velocity-prevents deposition of solids. Confined influent assures controlled headloss. Peripheral effluent reduces short circuiting – Makes weir and channel cleaning easy.

Orifices. Correct size, length and spacing eliminates “jetting action” into basin and spiral flow vectors. Spacing prevents solids deposition and permits equal flow distribution around tank periphery.

Influent skirt baffle. Extends five feet below water surface to define clear liquid zone. Allows low inlet velocities, defines inlet completely around the periphery for uniform flow distribution.

Raceway scum removal. Scum is concentrated in a small area easily accessible from outside the basin.



Hydraulic Dye Tracer Studies

Extensive hydraulic dye tracer studies on actual field installations have conclusively proven that the Rim-Flo® Clarifier design eliminates short circuiting, permitting full utilization of tank volume. In the chart above, the flow pattern in a typical Rim-Flo® tank, 98' dia x 12' SWD, is clearly depicted.

Studies were made at 10 minute, 20 minute and 40 minute intervals after appearance of the dye in the influent channel. Note that the full tank volume has been effectively utilized and that severe short circuiting is non-existent.

This complete utilization of available tank volume is the principal reason why a Rim-Flo® Clarifier can cut surface area requirements as much as 50% compared to the conventional center feed unit.

Note that there is no perceptible side wall effect to cause short circuiting. With center feed units, however, the flow enters the basin at relatively high velocity, causing eddy currents. Even with precise placements of the effluent launder and baffling away from the side wall, the eddy currents are still experienced with consequent reduction in capacity.

Uniform Distribution

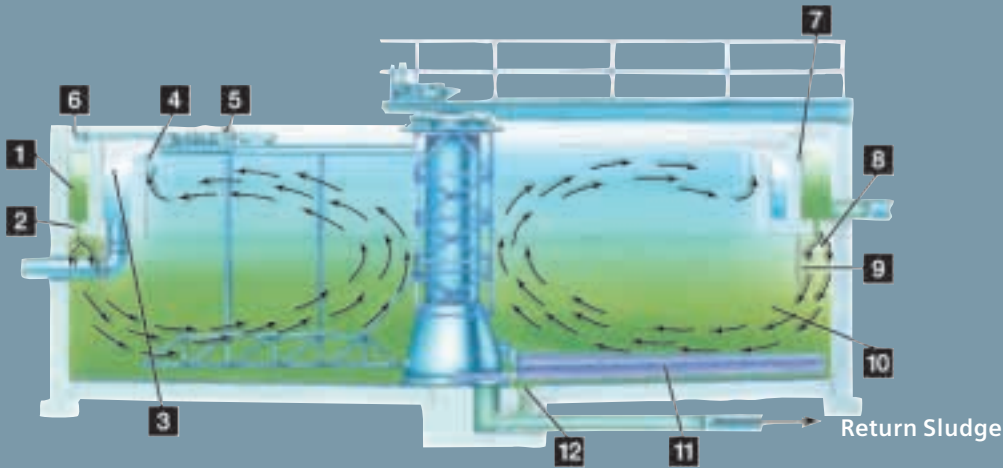
Influent is introduced into a channel surrounding the periphery of the tank. The channel has a varied cross section that helps maintain a constant velocity in the channel so as to prevent settling out of solids. The confined influent provides a uniform distribution around the periphery.

Orifices in the feed channel floor are computer sized and spaced to provide a controlled headloss that assures an equalized flow distribution into the tank around the entire periphery. Orifice spacing also helps prevent deposition of solids on the channel floor.

Complete, Rapid Diffusion

As the controlled flow enters the tank through the orifices it is deflected by a baffle on the underside of the feed channel. This baffle, and the orifice length (never greater than the channel floor thickness), eliminates "jetting" action into the basin. The flow is diffused rapidly and completely in the large area between the tank wall and the influent skirt baffle. The skirt baffle defines a clear liquid zone and its cross sectional area is such that the inlet velocities are controlled at not greater than 5-feet per minute at maximum flow.

Flow enters the tank near the bottom below the skirt baffle uniformly and at low velocities. The flow moves outwards, up and back to the peripheral effluent channel in a gentle circular motion. Full tank volume is utilized. Eddies that cause short circuiting are eliminated. Solids uniformly drop out of suspension.



Rim-Flo[®] is Cost Effective

1. Influent Channel

(varying width to suit flow requirements). Varied cross section controls flow and prevents solids drop out in channel. Can be provided in unidirectional or split-flow styles.

2. Inlet Orifice

Computer sized and spaced to provide controlled headloss for equal flow distribution into tank around entire periphery. Eliminates "jetting" action into basin and spiral flow vectors. Spacing also prevents solids drop out.

3. Effluent Channel

(varying width) Hydraulically designed for wide range of flows. Effluent at the periphery reduces short circuiting. Helps make cleaning of weirs and channel easier.

4. Effluent Weir and Scum

Adjustable V-notched weir. Scum baffle, attached to effluent launder, effectively prevents scum from entering the effluent channel.

5. Full Surface Skimming

Surface skimmer with attached inlet channel skimmer mounted on vertical arms attached to truss.

6. Scum Removal

Raceway scum is concentrated in a small area easily accessible from outside the basin. Weir gate skimmer provides complete, effective removal.

7. Common Channel Wall

Assures substantial savings in construction costs.

8. Deflector Baffled

Located under orifice. Eliminates "jetting" and spiral flow vectors. Assures rapid, complete flow dispersion.

9. Influent Skirt Baffle

Extends five feet below water surface. Helps direct flow into distribution zone. Defines inlet completely around the periphery for uniform flow distribution and acts as a flocculation zone. Controls velocity to not more than 5 FPM at maximum flow. Steel plate (3/16") will not be damaged during construction or wash down.

10. Large Inlet Area

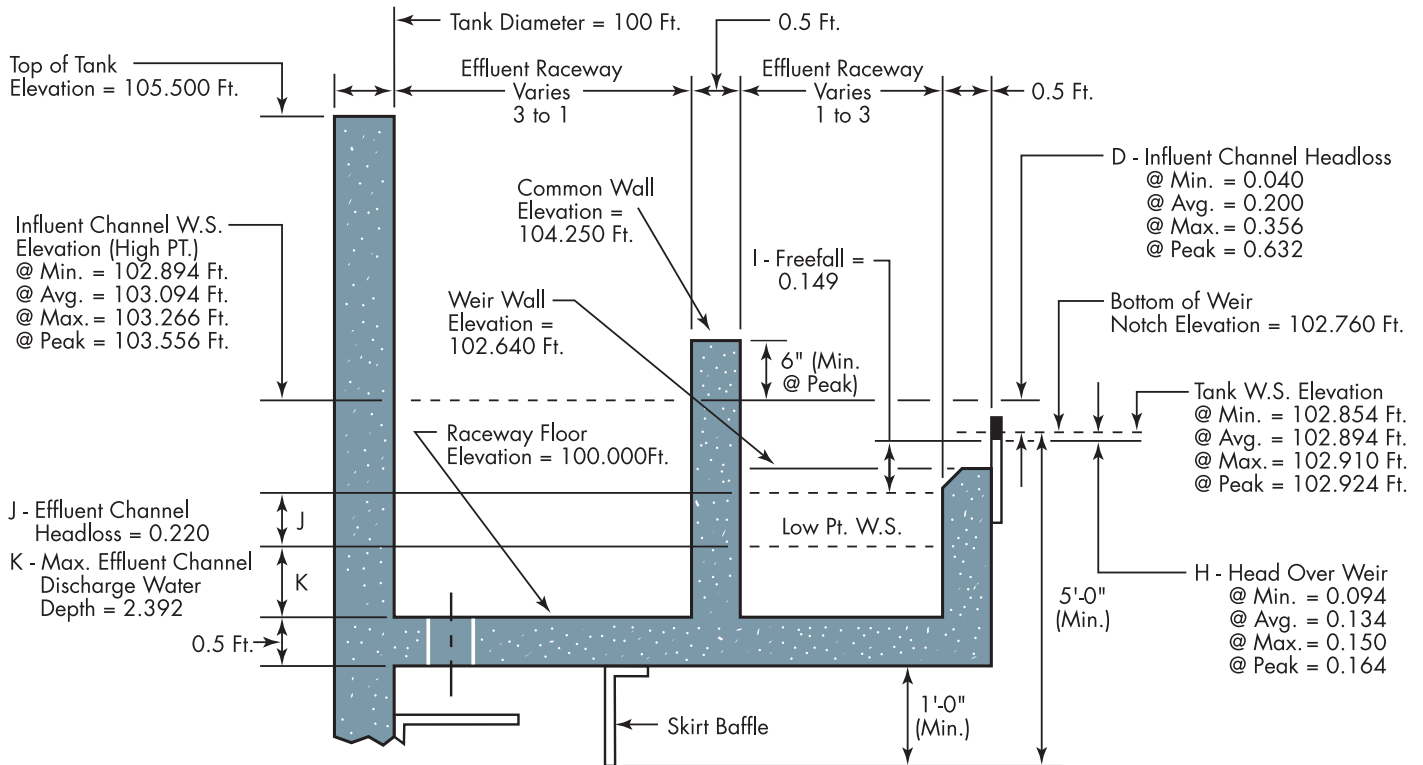
Assures low entrance velocities and aids flocculation.

11. Tow-Bro[®] Remover

For most effective removal of activated sludge.

12. Tank Drain

Rim-Flo® Clarifier Hydraulic Profile



	Min.	Avg.	Max.	Peak
Effluent Flow (MGD)	2.500	6.000	8.000	10.000
Return Flow (MGD)	1.500	3.000	4.000	6.000
Mixed Liquor Flow (MGD)	4.000	9.000	12.000	16.000

Confidential All Rights Reserved
 Project Name: 12345 Location: Sample
 User: RJG Date: 4/23/97
 Time: 10:28:21 AM

Total headloss through tank is
 the sum of D, H, I & J = 1.165 Ft.
 @ Max. Submerged Discharge

A hydraulic profile can be furnished for your application

Since hydraulic loadings vary so widely it is mandatory that the precise relationship of channel widths and cross section to orifice size and locations, tank size and overflow rates be accurately determined. With the Rim-Flo® Clarifier all these calculations are determined by computer from a data bank based on years of successful field experience. A sample hydraulic profile is shown here to indicate these design criteria. We can furnish a computer design for your specific application if you supply us with the design flows.



Four 110-foot diameter tanks in this wastewater treatment plant operate at an average raw flow of 400 GPD per square foot of overflow. Effluent BOD ranges from 4 to 6 ppm.



Four 120-foot diameter Rim-Flo® tanks operate at 700 GPD per square foot of overflow in this installation. Effluent quality is 3 to 7 ppm BOD and SS.

Applications and Skimming

Rim-Flo® Clarifier design, with both influent and effluent channels located on the tank periphery, permits effective skimming of the entire tank surface as well as the influent raceway.

In the Rim-Flo® Clarifier, collected surface scum is prevented from entering the effluent channel by a scum baffle attached to the effluent launder. A hinged wiper assembly and blade assures constant contact between blade, scum baffle and beach as the blade travels up the beach.

Influent channel skimming is provided by a blade mounted on an extension of the skimmer arm that directs scum in the channel to a weir gate for removal. This skimmer design prevents scum from bridging in the channel.

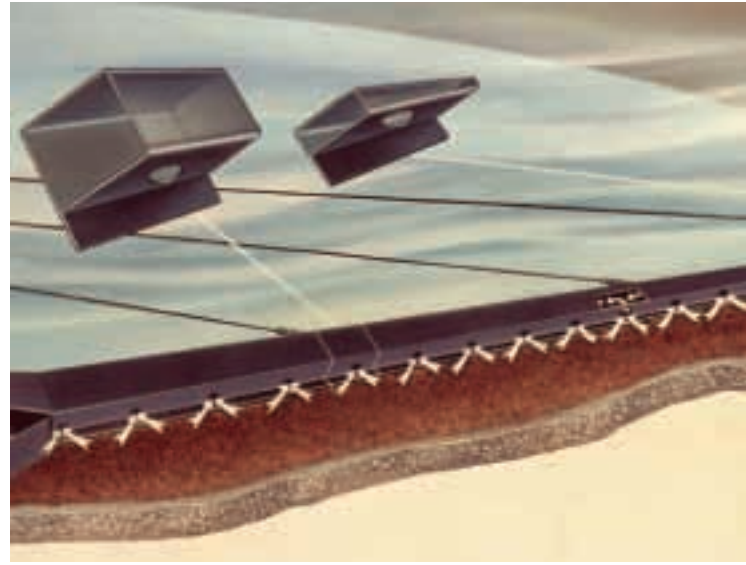
The weir gate is an economical standard design. Collected scum is directed by the flow and skimmer arm to the scum box area. The gate is lowered when the scum is to be removed from the channel. Type and volume of floatable material dictates the operating time cycle.

The gate is available in a number of options-manual or motorized, time clock, limit switch or sensing probe.

Siemens Water Technologies can also supply other scum removal devices including telescopic sludge valves, scum pipes, water sprays and flushers.



High strength dairy wastes in the effluent do not affect the performance of these two 80-foot diameter Rim-Flo® tanks. Average raw flow is 400 GPD per square foot of overflow. BOD and SS in the effluent average between 3 to 5 ppm.



Tow-Bro® Unitube Sludge Removers

Fast, Uniform Sludge Removal

Tow-Bro® Unitube sludge removers offer the ultimate in fast, uniform sludge removal. A gentle suction action removes biological and light sludge in one pass of the header arm. Sludge is fresher, less chance for septicity. Tow-Bro® Unitube provides maximum concentration of solids with minimum sludge agitation.

Proven Performance to Match Objectives

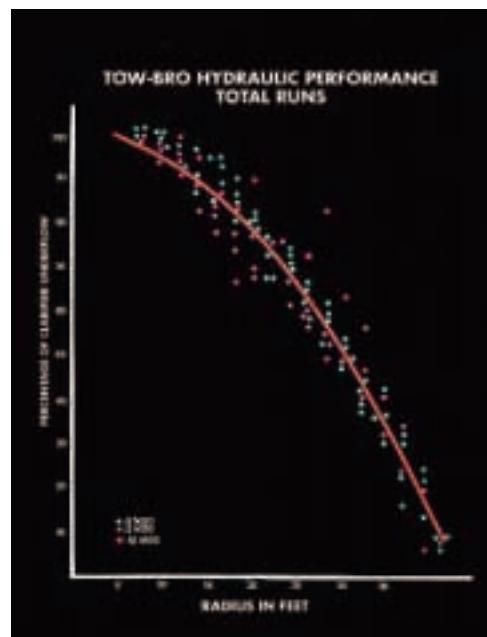
And the computer-designed Tow-Bro® header can prove that its actual operating performance can match theoretical design objectives. The adjacent chart shows actual test results in an operating installation – compares the actual versus the ideal flow withdrawal. Copies of this test are available upon request.

Flat Tank Floors and Economy

But there's more to Tow-Bro® Unitube. Economy, for example. Tank floors are flat so excavation and forming are simpler. Torque requirements are lower because there is no scraping or plowing needed. You use less energy to move the system. Better sludge means less aeration and solids handling volume – another power-saver.

Tow-Bro® Unitube is simplicity itself. Only one valve controls sludge withdrawal. Orifice plugging is rare. Clogging is non-existent. Maintenance is rarely required.

The complete story of Tow-Bro® Unitube advantages are covered in Bulletin No. EN-TOWBROdr-BR-1208. Ask for it.



Envirex, Rim-Flo and Tow-Bro are registered trademarks of Siemens, its subsidiaries or affiliates.

The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

Tel: +1.262.547.0141
Fax: +1.262.547.4120

EN-RIMFLOdr-BR-0409

Subject to change without prior notice.

©2009 Siemens Water Technologies Corp.