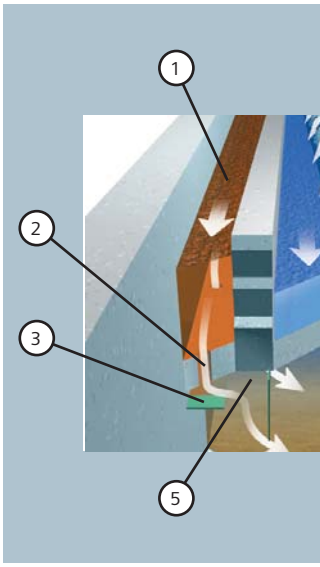
Trans-Flo® Secondary Clarifier With Hydraulic Sludge Removal

Water Technologies

SIEMENS

Sludge removal header and orifices (black)

Trans-Flo® clarifier steel trough retrofit in progress. Influent channel and orifices (grey). Effluent channel and weir (blue).



Trans-Flo® Clarifier has all the Advantages

Three Proven Technologies in one Clarifier

The Trans-Flo® secondary clarifier is a major design advance. It is a proprietary combination of three proven wastewater technologies, with the process benefits of each.

As a result, when compared to a typical rectangular activated sludge clarifier, Trans-Flo® clarifiers can be designed with greater mass loading and flow capacities in much longer and wider basins.

Additionally, this new design produces a secondary effluent that's lower in suspended solids, although it performs in a smaller space and at lower construction and equipment costs than an average clarifier.

How the Trans-Flo® Clarifier works

The Trans-Flo® clarifier combines in one basin a Rim-Flo® peripheral feed, peripheral takeoff clarifier; a Tow-Bro® hydraulic sludge remover; and a rectangular chain and scraper collector.

Influent is introduced into a channel extending the length of the tank and enters the tank through the inlet orifices.

Flow moves downward, then transversely across the tank, up and back to the effluent channel. Full tank volume is used. Short circuiting is eliminated. Solids drop uniformly out of suspension.

Solids that drop to the floor are moved by a chain and flight mechanism to the next hydraulic sludge removal header. The flights move at 1 foot per minute or less, preventing disturbance to the sludge blanket and resulting in lower effluent suspended solids.

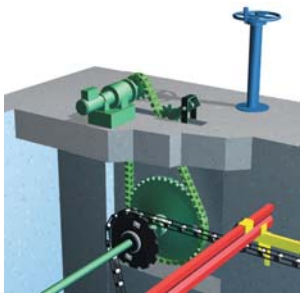
The sludge removal headers are equipped with a series of orifices to continuously remove settled sludge, uniformly across the width of the tank.

The thickest layer of the sludge blanket is always removed first, so that the necessary pounds of solids required to maintain the activated sludge process are returned without unnecessary dilution.

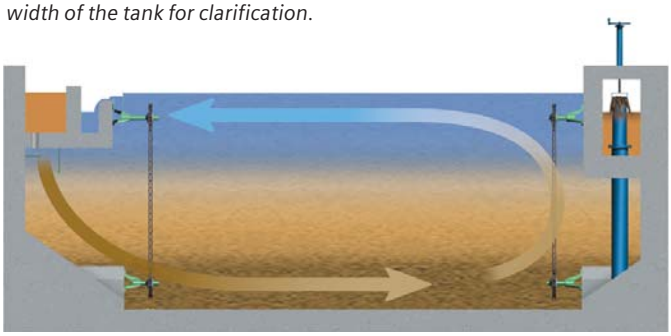
Because solids deposition is uniform along the tank's length, sludge removal headers are evenly spaced to keep the average sludge age of the removed solids in the range of 20 minutes.

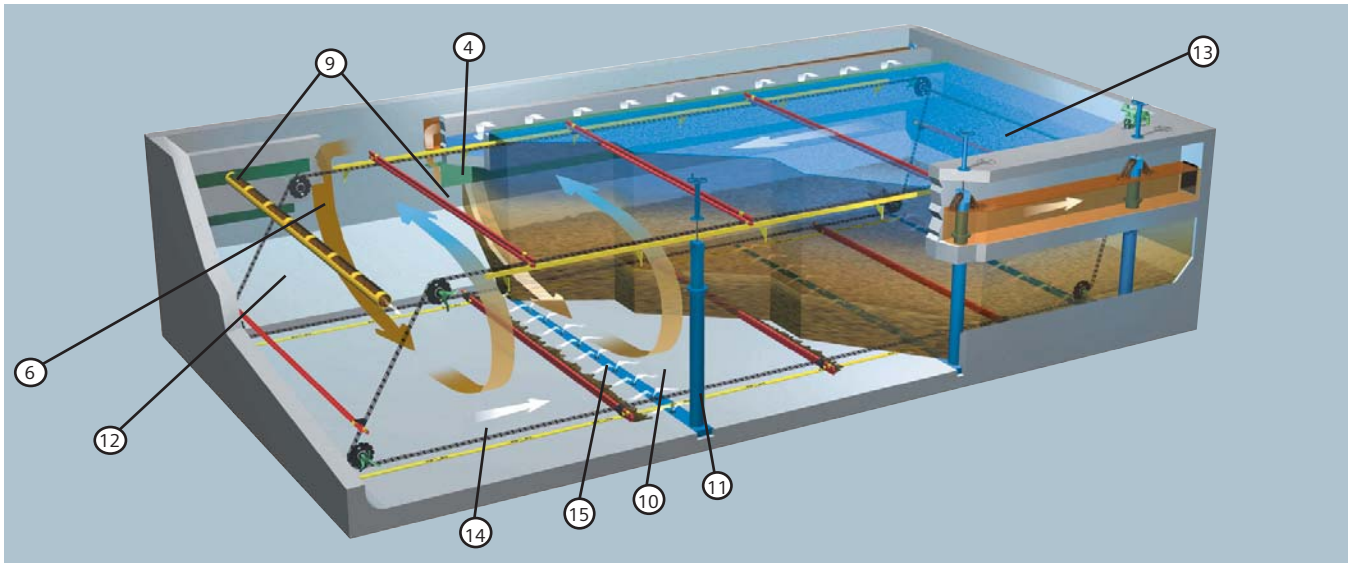
This assures a fresher, concentrated sludge, reduced aeration requirements, and lower effluent solids.

The chain and scraper collector system has proven reliability. It employs advanced and compatible materials for chain, sprockets and flights, giving the system reduced wear and an extended life. Installation of a new collector is economical. Retrofitting an existing rectangular basin is affordable. Stub shafts are used to eliminate corner bearing maintenance.



This section view illustrates how the transverse folded flow uses the full width of the tank for clarification.





1. **Influent Channel.** Varied cross section controls flow, prevents solids drop out.

2. **Inlet Orifices.** Sized and spaced to provide controlled headloss for equal flow distribution into basin along entire length. They eliminate "jetting" action into basin and spiral flow vectors.

3. **Inlet Baffle.** Provides rapid, complete dispersion of flow. Eliminates "jetting."

4. **Influent Skirt Baffle.** Defines inlet along length of tank for uniform flow distribution and acts as a flocculation zone. Reduces inlet velocity to not more than 5 feet per minute at maximum flow.

5. **Large Inlet Area.** Assures low entrance velocities, aids passive flocculation.

6. **Transverse Folded Flow.** Utilizes full length and width of tank. Maximizes overflow rates. Eliminates short circuiting.

7. **Effluent Channel.** Hydraulically sized for wide range of flows. Tapered cross section maintains flow through the channel. Reduces short circuiting.

8. **Effluent Weir and Scum Baffle.** Weir is adjustable. Scum prevented from entering the effluent channel.

9. **Full Surface Skimming.** Positive scum removal.

10 **Hydraulic Sludge Removal Headers.** Multiple headers with large diameter orifices provide positive and consistent sludge removal along the full tank length. Proven in water treatment, industrial wastewater and municipal wastewater applications.

11. **Sludge Removal Orifices.** Spaced no more than 30 inches apart, so maximum distance between orifices is 15 inches, preventing concentrated sludge from bypassing the orifices.

12. **Corner Slopes.** Direct sludge blanket to basin floor, for removal.

13. **Telescopic Sludge Valve.** Provide variable control of sludge withdrawal rate. Can be manually operated or furnished with motorized operator for automatic operation.

14. **Collector Chain.** Either Envirex® molded or high strength Envirex® loop chain. Easy installation, long life, proven reliability.

15. **Flight.** Envirex® fiberglass flights available in 6 and 8 inch sizes, up to 33 feet (10 m) long. Scraping lip optimizes tank cleaning, provides mild fluidizing for sludge transport to withdrawal orifices.

Benefits of the Trans-Flo® Clarifier

The Trans-Flo® secondary clarifier is a comparatively inexpensive retrofit for existing tanks and, because of its common wall construction, a cost effective option for large multiple tank applications or sites where space is limited. It is well suited for replacing traveling bridges, track vacs or sludge suckers. In new construction, the Trans-Flo® clarifier requires less equipment and has lower construction costs than circular basins. Rectangular basins can be up to 33 feet wide by 300 feet and longer. Benefits include:

- Transverse, Folded Flow: maximizes flow capacity, eliminates influent short circuiting, produces lower effluent suspended solids, minimizes tank length requirements, reduces space requirements
- Multiple Sludge Withdrawal Headers: maximize mass loading capacity, rapid sludge removal minimizes solids retention time, limits sludge denitrification
- Chain & Scraper Collector: flat basin floor, lower construction costs, common wall construction, minimal disturbance of sludge blanket for lower effluent suspended solids, easy retrofit

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