

WASTEWATER TREATMENT SYSTEMS



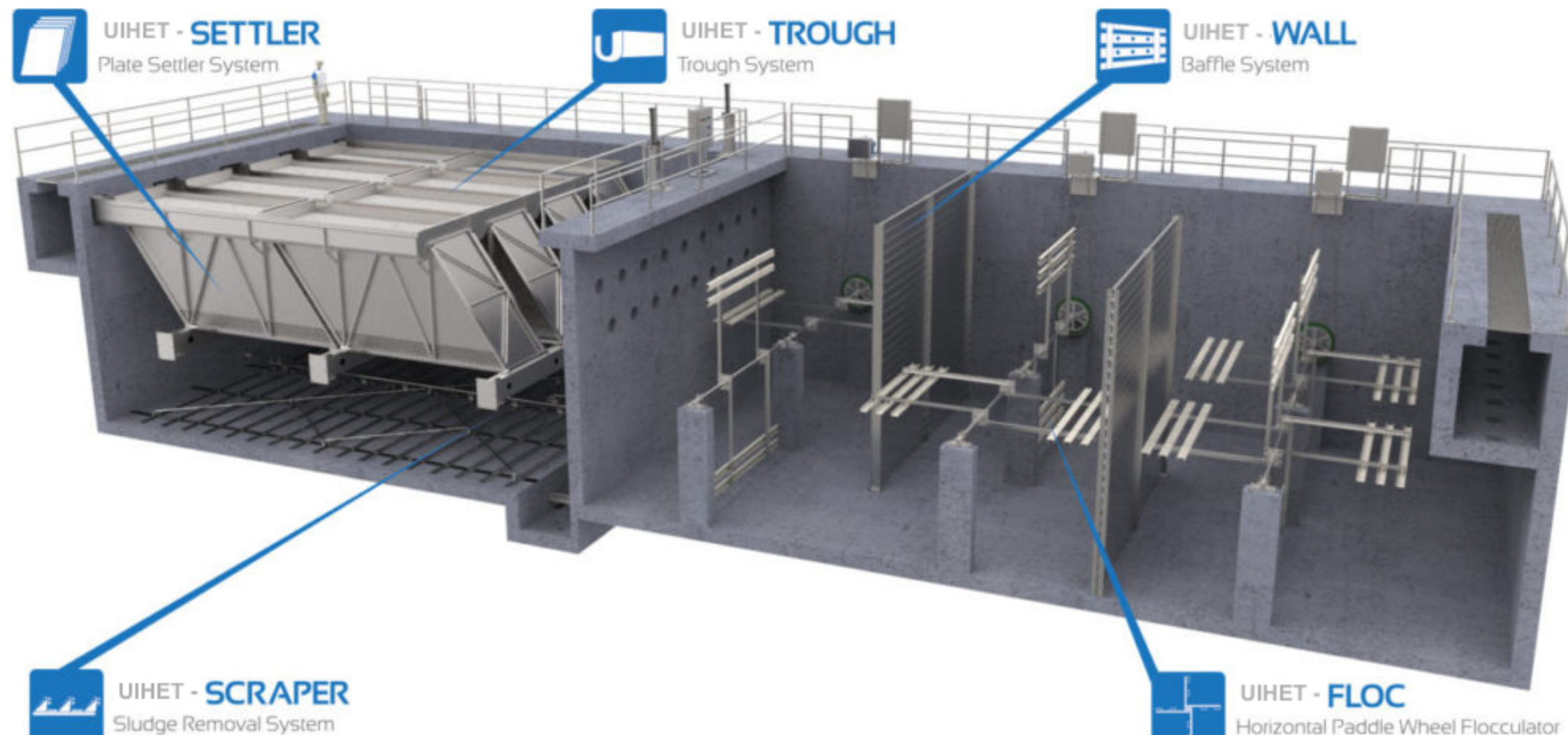
United International
HYDRO ENGINEERING TECHNOLOGIES

LAMELLA SETTLERS SYSTEM



GENERAL DESCRIPTION

Lamella Media by **United International Hydro Engineering Technologies (UIHET)** are designed to remove high concentrations of suspended solids from water, where the solids have a specific gravity >1.0 . They are ideal for applications where the solids loading is >30 mg/L, particle sizing is fine, or for removal of dissolved metals via hydroxide precipitation. The standard treatment process includes coagulant dosing and mixing, followed by solids separation with automated sludge wasting. Additional treatment steps, such as pH correction for precipitation of heavy metals, and various optional equipment is available to suit project specific requirements.



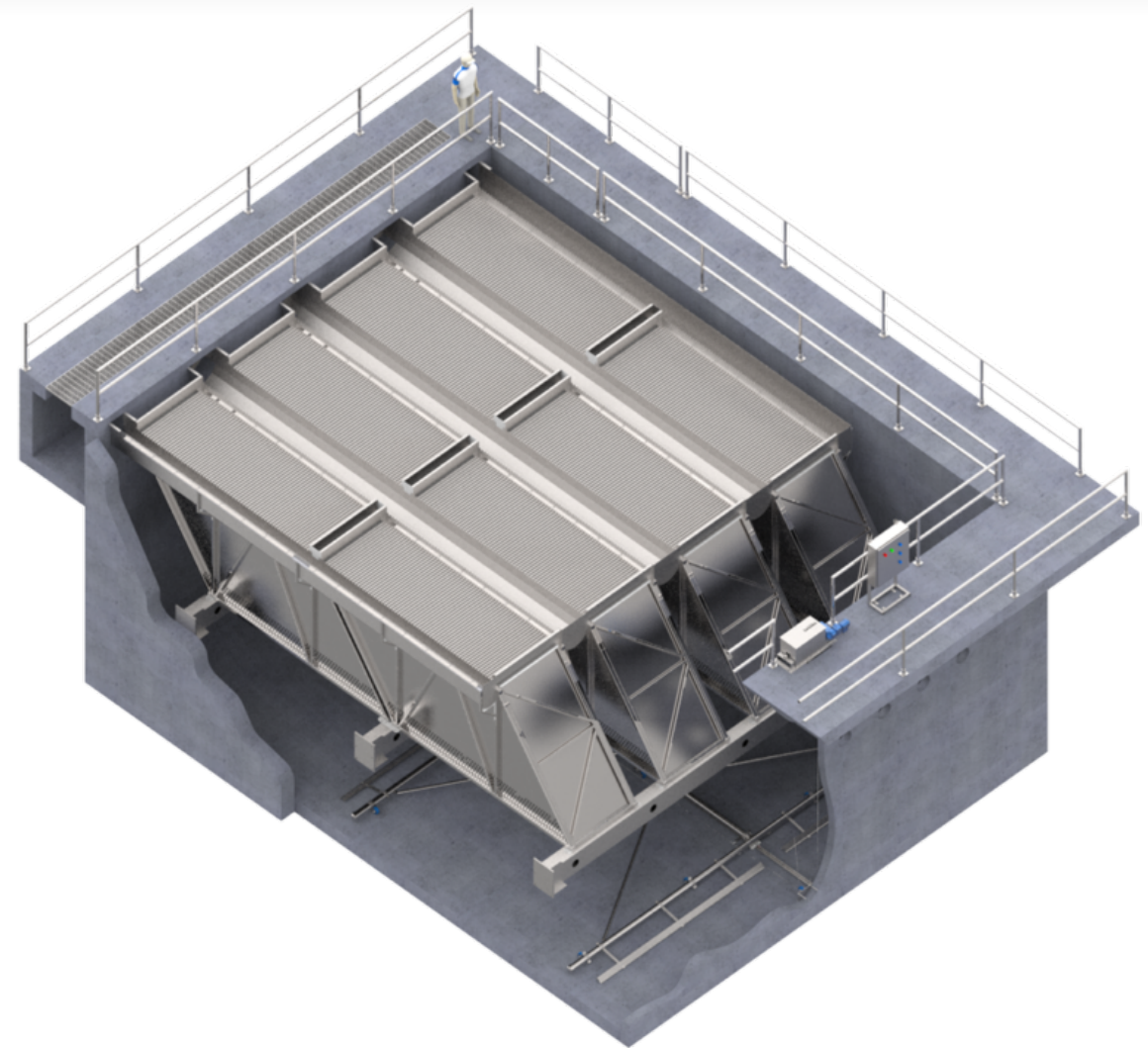
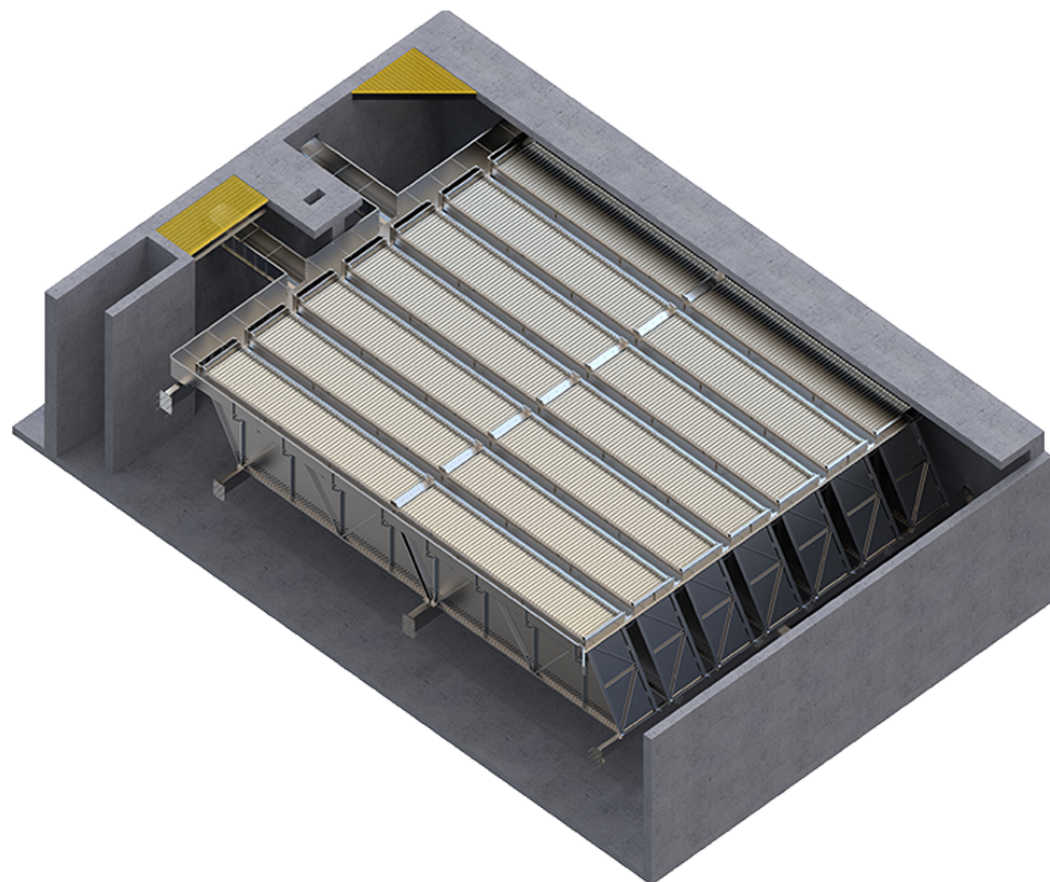
WORKING PRINCIPLE

The principle of shallow depth sedimentation has been extended to the design of a parallel plate system, sometimes referred to as lamella clarifiers. The Lamella clarifier works when a solid/liquid stream that has been flocculated, enters a tank, and flows upward between a pack of inclined plates. The solids fall to the plate surface, where they slide by gravity down to a sludge collection hopper. The clarified effluent flows through orifice holes and exits the top of the settler.

LAMELLA SETTLERS SYSTEM COMPONENT

LAMELLA CLARIFIER

At **UIHET**, we design our Settler System to best suit any basin geometry and sludge collection system in both, concrete underground tanks or Stainless tank. This approach can dramatically reduce the footprint of a conventional sedimentation basin, often by as much as 50 to 90%. It can also significantly increase the treatment capacity of existing basins while improving effluent quality. Compared to similar out put sedimentation basins without settlers, the **UIHET** Settler System requires a much smaller footprint, performs consistently better, is more reliable, and when all capital, construction, and operational costs are factored in over the life of the system can actually cost less.

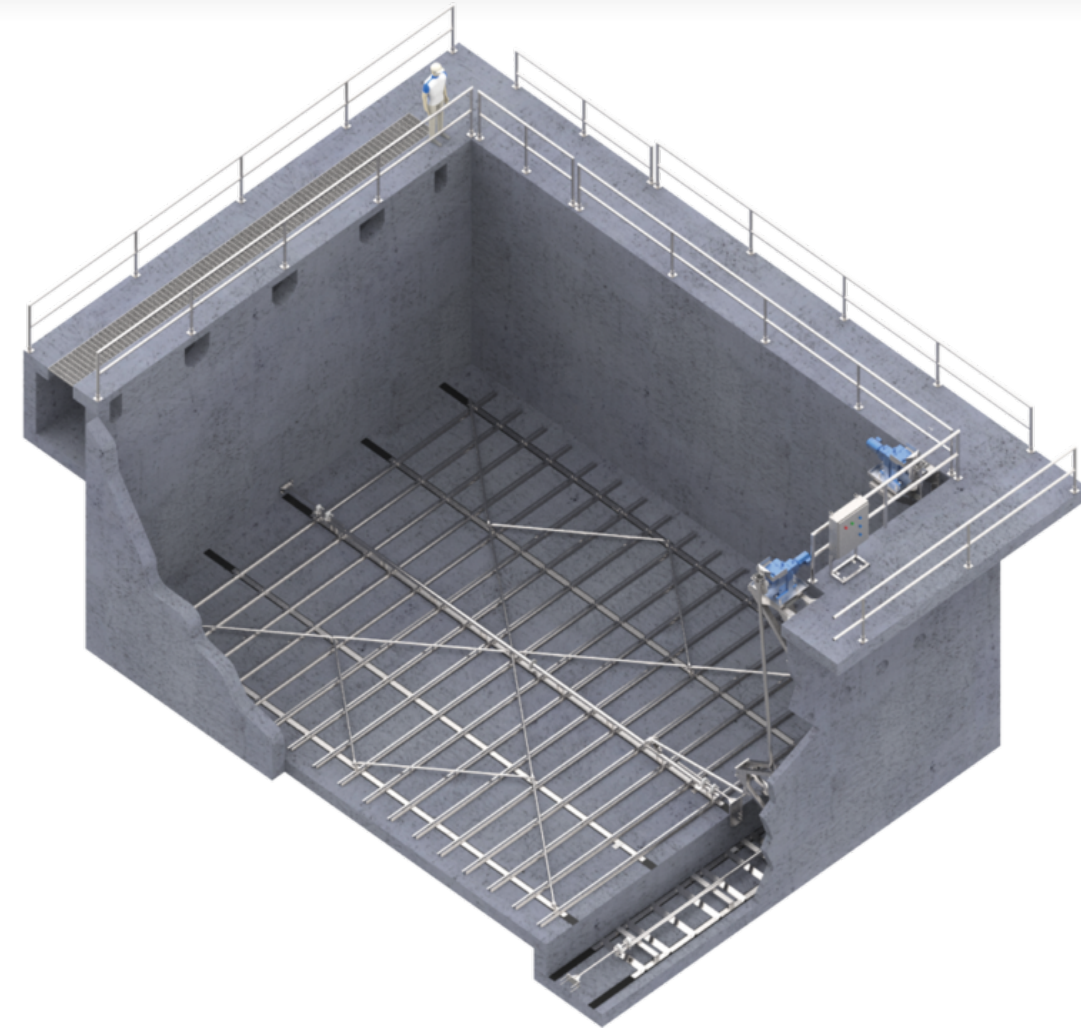


Lamella Clarifier is a compact and inclined plate type of clarifier which is used to clarify the water & waste water which has higher suspended & colloidal particles. The work principle is based on the settlement of colloidal particles by providing a larger surface area. Its application areas include water clarification, sewage treatment and effluent. Lamella Clarifier is a type of high rate clarifier. This system provides large effective settling area for a small foot prints to separate particulates from liquid. It can be designed in both underground (Concrete) and aboveground system (stainless steel).

LAMELLA SETTLERS SYSTEM COMPONENT

LAMELLA SCRAPER

Sedimentation basins are a key part of the water treatment process as they prepare water for final filtration. Excessive buildup of sludge can lead to turbidity issues, loss of effective tank volume, and can negatively affect downstream membranes and/or filters. The **UIHET** Scraper, a simple and reliable answer to sludge removal needs, was developed by **UIHET** design engineers using proven design concepts developed over an experience in outfitting sedimentation basins. The **UIHET** Scraper hydro-dynamically designed blades and reciprocating motion produce a thickening effect of the sludge blanket while creating a zone of influence that moves solids toward the sludge collection pit.



On the forward stroke this blade design transports sludge forward, and slides under the blanket without disturbance of the sedimentation process on the reverse stroke. The speed of the reverse stroke is 2-3 times the forward stroke speed. Based on sound principles, but flexible by design, it is applicable in both water and wastewater sedimentation systems. The **UIHET** Scraper robust design allows for intermittent or continuous operation without excessive wear, and maximum torque development. A specialized energy transfer triangle attached to the vertical connection shaft and motion transfer rod, transfers energy to the scraper assembly. **UIHET** Scraper is generally set on an intermittent basis, but frequency and speed can be easily adjusted for changes in sludge characteristics.

LAMELLA SETTLERS SYSTEM COMPONENT

FLOCCULATOR

Our **UIHET** Flocculators design has already proven itself in hundreds of successful applications throughout the wastewater treatment plants. **UIHET** in-depth knowledge of both the water and wastewater treatment markets allows us to fully understand your process and provide solutions like the Paddle Wheel Flocculators, solutions designed with operational efficiency in mind. Like all **UIHET** products, our Flocculators line offers an unsurpassed level of performance geared around the longest possible component life and the lowest maintenance demands of any comparable flocculator system. Just three words: Proven, Process, Performance, speak volumes. **UIHET** has the answers you want, the solutions you need, and the support you deserve. **UIHET's** Flocculators can be integrated into a treatment process, or supplied as a stand-alone system. Increasingly, treatment plants are asked to do more and the need for maximizing what's available has never been more evident.

Three types of the Flocculators can be used in the lamella settler system, these tapes are as follow:

- Horizontal Wheel Paddle Flocculator
- Vertical Wheel Paddle Flocculator
- Walking Beam Flocculator.



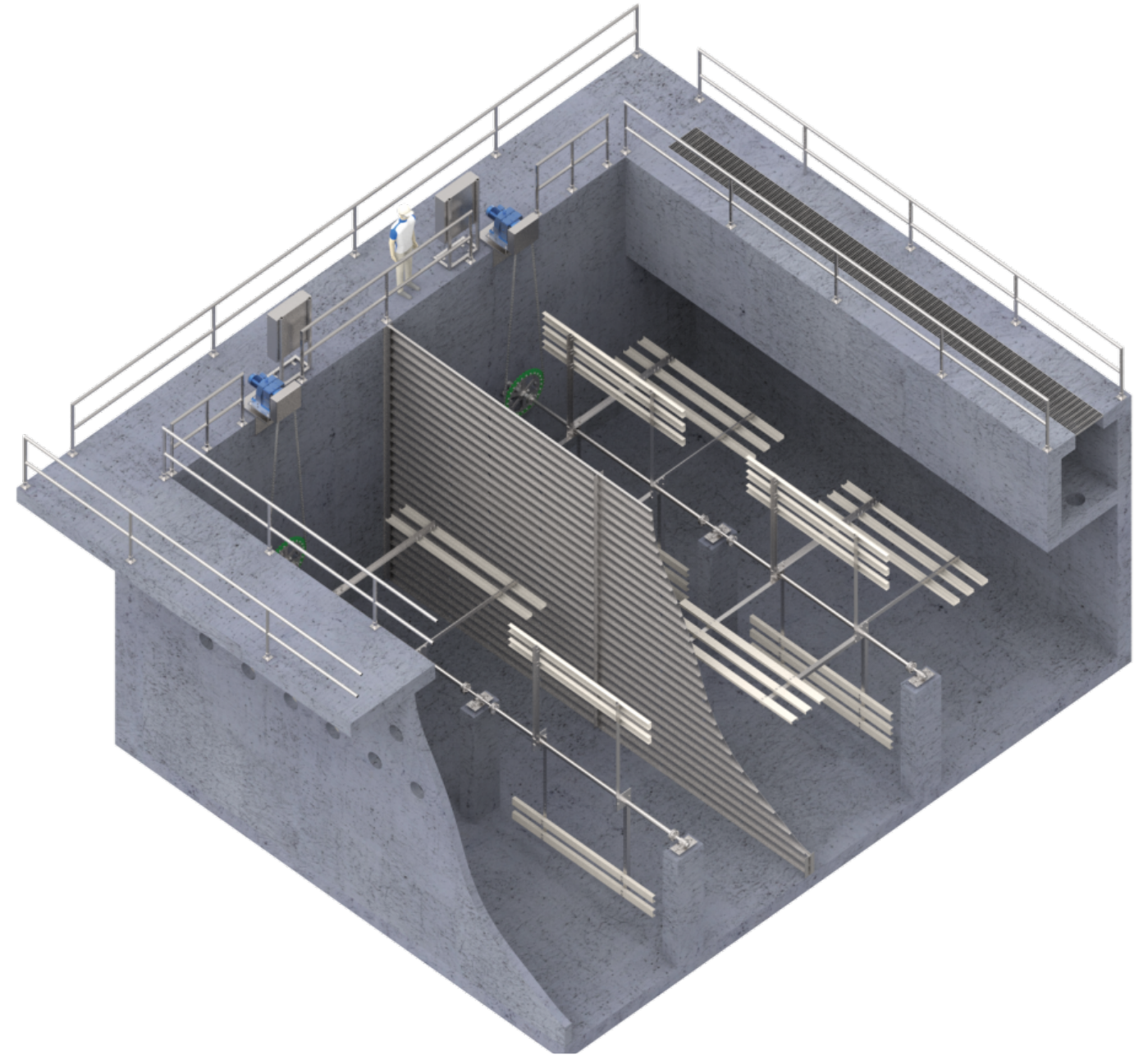
FLOCCULATOR TYPES

HORIZONTAL WHEEL PADDLE FLOCCULATOR

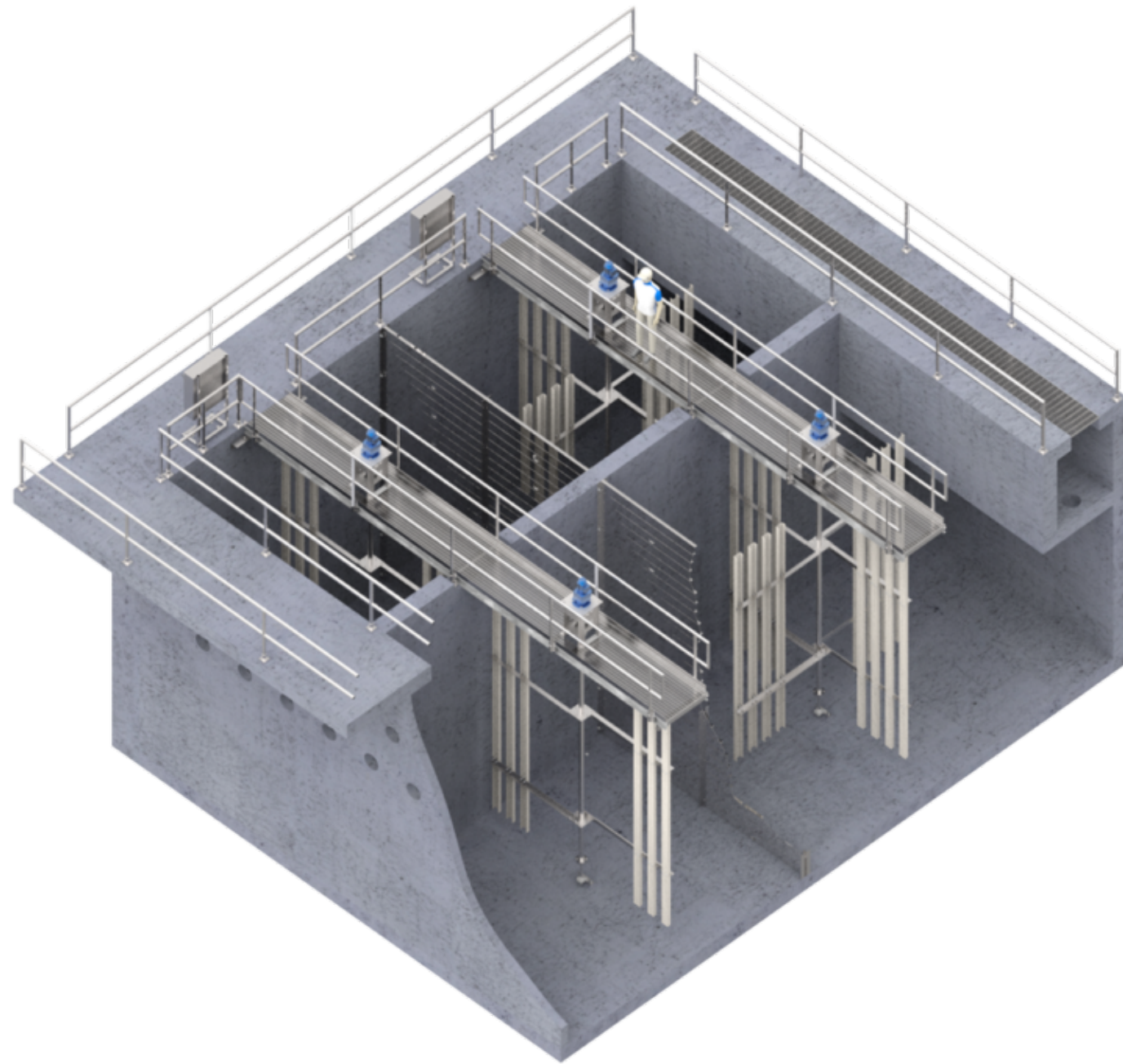
One of the most economical options available for almost any flocculation need, **UIHET** Horizontal Paddle Wheel Flocculator have been utilized in a lot of plants across the meddle east (a large majority of which have been provided by **UIHET**). Ideally suited for large production plants, Horizontal Paddle Wheel Flocculators provide the best value per million gallons per day (MGD) of any comparable design available. Horizontal Wheel Paddle Flocculator have the following advantages:

- Minimal wear parts
- Single drive assembly for multiple flocculation reels
- Proprietary features designed to both reduce maintenance demands and enhance component life

In no area is **UIHET** knowledge more evident than in the Horizontal Paddle Wheel Flocculator drive train with integral chain tensioning. Selection of materials of construction and use of the **UIHET** proprietary design program optimize performance and minimize maintenance costs over the system's life cycle. Having sold more Horizontal Paddle Wheel Flocculator than any other supplier, use of **UIHET** know-how determines optimal gearmotor horsepower requirements using the desired velocity gradient, system efficiencies, and safety factors. The industry leading choice of SS for the drive sprocket hub, non-metallic UHMW-PE sprocket teeth, and specialized SS chain are **UIHET** enhancements that utilize the latest in technology, for trouble free continuous operation. Drive trains are available in wet chain, dry chain, and direct coupled options.



FLOCCULATOR TYPES



VERTICAL WHEEL PADDLE FLOCCULATOR

UIHET Vertical Paddle Wheel Flocculator offers a wide range of flexibility with easy installation, and the proven process performance of a paddle wheel design. **UIHET** Vertical Paddle Wheel Flocculators follow the “Ten States Standards” and are optimized to produce the highest quality floc particles. With hundreds of our **UIHET** Vertical Paddle Wheel Flocculator installations in operation, **UIHET** has refined our design with unique and important features for maximum equipment reliability and longevity.

- Very little maintenance required
- All mechanical parts above the water line
- Minimal wear items
- Easy access for operator maintenance
- Optimum process control
- Low tip speed, Homogeneous mixing

Engineered in a range of sizes to meet process demands, every **UIHET** Vertical Paddle Wheel Flocculator drive assembly (gear motor, drive stand weldment, chain coupling, thrust collar, radial thrust bearing, and drive shaft assembly) is designed and built to uncompromising standards. The result is powerful, reliable, uninterrupted performance. To protect the gear reducer and ensure the longest possible component life, a radial thrust bearing takes the brunt of all loads (vertical, axial, radial, etc.). This commonsense design and accessibility makes operational and maintenance procedures a breeze.

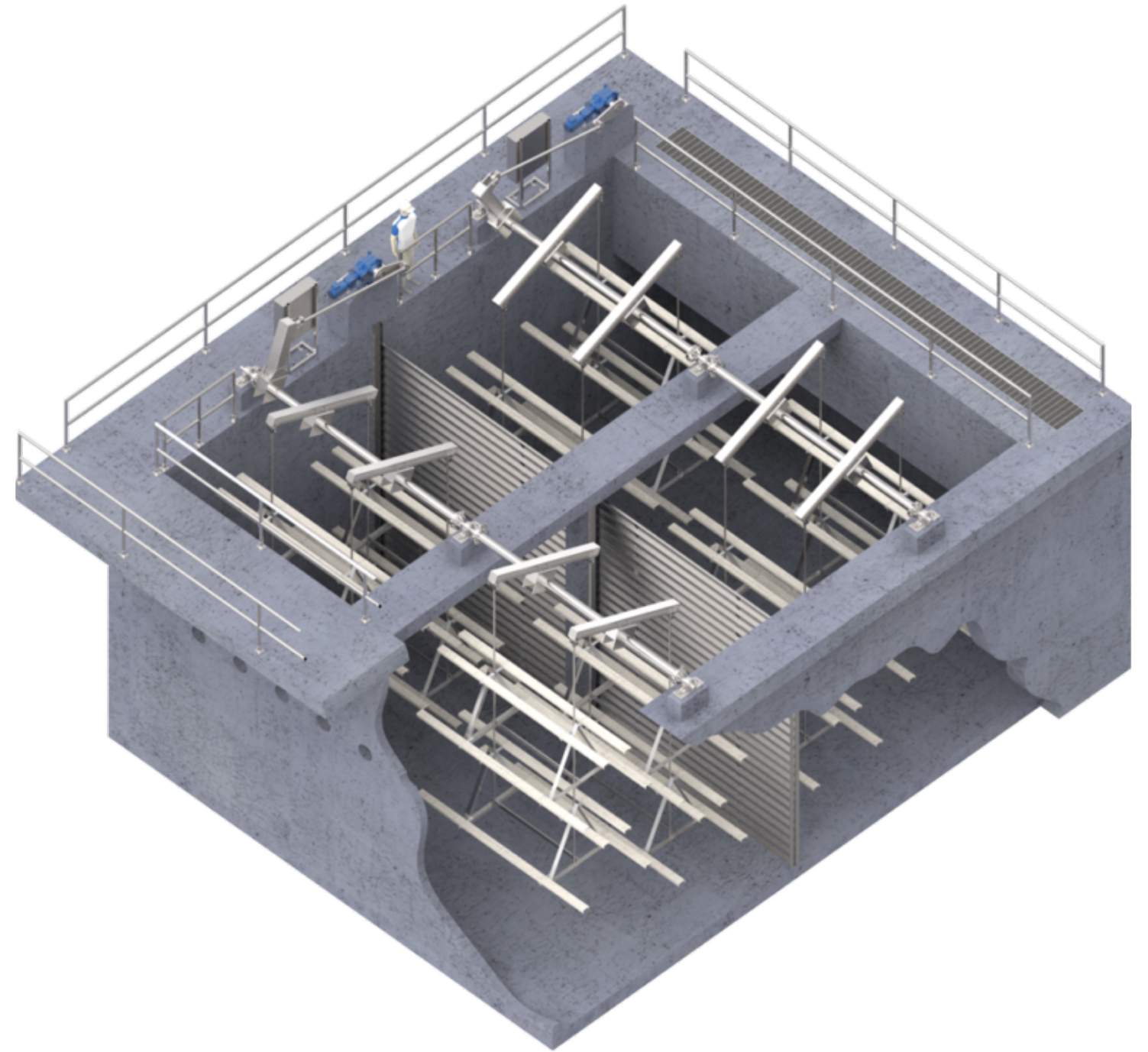
FLOCCULATOR TYPES

WALKING BEAM FLOCCULATOR

When process needs demand optimum flocculation performance, **UIHET** offers its **Walking Beam Flocculator**. One of the most effective and reliable systems available today, **UIHET** walking beam flocculators combine vertical and linear movement to maximize Brownian motion, encouraging floc formation in the basin. The risk of mass rotation, common to impeller style systems, is eliminated, as are laminar flow and short-circuiting. **UIHET** has provided more (Walking Beam Flocculator) than any other manufacturer and has the proven, proprietary knowledge to design a system to meet your needs.

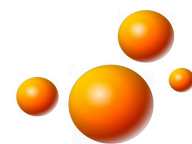
- Minimal wear items (no chains, stuffing boxes, bottom steady guides, etc.)
- All bearings are heavy duty roller bearings
- Oscillating motion ideal for flocculation
- Eliminates mass rotation present in all other flocculation equipment
- Varying tip speeds throughout a given cycle promotes high-level floc formation

UIHET Walking Beam Flocculator uses reciprocating vertical paddle motion to achieve the wide range of velocities needed to maximize flocculation. Linear paddle velocities vary cyclically from zero feet per second to an adjustable maximum rate deemed ideal for effective solids flocculation without risk of floc shear. An upstroke suction lift on the bottom of the basin prevents floc fallout and aids in seeding the newly forming floc, while a downstroke generates turbulence to aid the production of robust floc particles. As motion is continuously transmitted to all areas of the basin, dead spots are eliminated.



WHY CHOOSE UNITED ENGINEERING LAMELLA SETTLERS SYSTEM?

- Smaller foot print than conventional settlement clarifiers
- Stainless tank delivered in one piece to reduce site construction time
- Can be supplied with integral flocculation tank & mixer
- Large solids hopper to increase sludge consistency by compaction
- Reliable and cost-effective
- Easy Access for Inspections & Replacement
- Can be designed in both underground and aboveground system
- Customizable dimension and nozzles sizes/ numbers to suit the client specific needs



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