

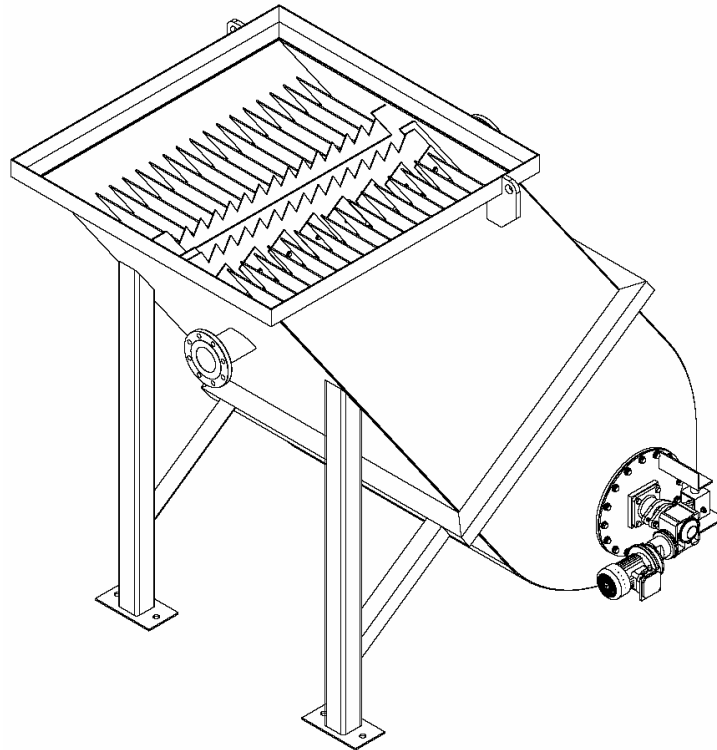
# HYDRO → FLO

TECHNOLOGIES, INC.

— THE ART & SCIENCE OF WASTEWATER TREATMENT —

## Installation, Operation & Maintenance Manual

### Inclined Plate Clarifiers



Revised 01/29/07

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## SECTION I PREFACE

The information found in this manual is based on years of experience with the installation, operation and maintenance of this type of equipment, however it is intended only as a guide. The methods that are available to you may require other, more appropriate procedures for the proper installation of this equipment. Proper care and safety should always be paramount. Use only qualified technicians and procedures in compliance with local building codes.

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### SECTION 1.01 WARRANTY

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Hydro-Flo Technologies, Inc. warrants its equipment to be free from defects in materials and workmanship for a period of one year from startup or 16 months from shipment, whichever occurs first. All component manufacturer's warranty will supersede this warranty and shall take precedence.

HYDRO-FLO TECHNOLOGIES, INC. will not accept any back charges for warranty work, changing, adjusting, servicing or any other work that has not received advanced written authorization. HYDRO-FLO TECHNOLOGIES, INC. will grant authorization for the changing, adjusting or servicing of this equipment only in the interest of warranty repair, or to correct any deficiency discovered. Such work will only be considered upon written agreement from Hydro-Flo Technologies, Inc. to do so.

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### SECTION 1.02 INSPECTION

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Thoroughly inspect all equipment upon arrival. If any items are missing or damaged, note this on the shipping papers and contact your transportation company representative and HYDRO-FLO TECHNOLOGIES, Inc. immediately.

Touch up all coatings damaged during shipment immediately. See the specification information for this particular piece of equipment for proper procedures for coatings touchups.

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### SECTION 1.03 STORAGE

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If you are not ready to install the equipment upon arrival, store it in an area away from traffic. The ground should be level and free of any sharp objects that might damage the structure or coatings. Store the equipment with all factory packing intact as much as possible until ready for installation. Store the equipment out of the elements, preferably indoors. If this is not possible, make sure the equipment does not fill with water and debris. Verify that ancillary components (accessories, pumps, instruments) were not shipped inside the unit prior to outdoor storage. If components were shipped inside of the unit, insure that they are stored in a manner that is appropriate with their respective I, O & M manuals.

**For outdoor storage, we recommend you cover the equipment with a tarp!**

Store any pumps and other accessory items in a similar fashion.

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### SECTION 1.04 ADDITIONAL INFORMATION

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**For additional information that may be required for this installation or for answers to any questions you might have, contact:**

**Hydro-Flo Technologies.**  
**3985 Commerce DR.**  
**St Charles, IL 60174**  
**Tel: (630) 762-0380 Fax: (630) 762-0390**  
[www.hydroflotech.com](http://www.hydroflotech.com)

## SECTION II      INSTALLATION

**CAUTION!** Prior to off-loading and installation of equipment, study the general arrangement drawing(s) and make yourself familiar with all aspects of the installation, operation and maintenance of this equipment.

### SECTION 2.01      TOOLS REQUIRED FOR INSTALLATION

- Masonry drill with masonry bit set for the installation of the equipment anchors (if applicable).
- Standard socket set, wrench set and miscellaneous drift pins for the installation and adjustment of the effluent weir.
- Carpenter's level for leveling width of unit.

### SECTION 2.02      LIFTING THE UNIT

Warning: Unit must be empty (no water) when lifted!

All units are designed to be lifted vertically and moved into place. Always lift the unit with a spreader bar to prevent damage to the float skimmer system.

Attach lifting cables directly to all lifting eyes on the unit. Check load balance and readjust if required.

### SECTION 2.03      ANCHORING AND LEVELING OF EQUIPMENT

**For the Clarifier to operate correctly the unit must be level.**

Steps for anchoring and leveling of the equipment are as follows:

1. Make sure that the ground is free of any sharp objects that might damage the coating.
2. Set the tank in position on a level floor or pad. If the floor or pad is not level, use a good quality machinery grout to level the unit after drilling and installing the anchor bolts. Follow the grout manufacturer's instructions for shimming and grouting when leveling the unit.
3. Mark the anchor bolt locations.
4. Move the equipment aside and drill holes for the anchors of your choice. Install the anchor bolts per the manufacturer's recommendations. We recommend using, as a minimum, 3/4" diameter x 4" - 6" long embedment type anchor bolts. Check local codes for seismic or other anchoring requirements.

\*      **HYDRO-FLO TECHNOLOGIES does not supply the anchor bolts.**

Note: If grouting is required, the height the anchor bolts extends above the surface must be increased to compensate for the thickness of the grout layer.

5. Set the unit back in place.
6. Level the unit from side to side by placing a good quality level on top of the fixed effluent weir wall.
7. Level the unit from influent end to effluent end by using the clear tubing filled with water. Level the unit so that the water in the clear tubing on both ends is at the top of the flange radius. Check level at several points on each end.
8. Securely tighten anchor bolt nuts.

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## SECTION 2.04 PLUMBING CONNECTIONS

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The plumbing connections typically required for the installation of a Clarifier unit include but are not limited to: influent, effluent, sludge draw off and effluent chamber drain. Please refer to the instructions below and your project specific drawings for details.

When making plumbing connections to the unit, the plumbing must be properly supported to carry the weight of the plumbing when full of water. Damage caused to this equipment by improperly supported plumbing will void the warranty.

Connections do not have to be made in the order listed below. Review your situation and make the plumbing connections in the most logical order for your installation.

The fittings on the unit are not designed to support a load due to connecting piping. When making connections to the unit, do not use the unit as a pipe support. All plumbing connections should be properly supported so as not to add stress to the unit's fittings.

HYDRO-FLO TECHNOLOGIES, INC. cannot honor a warranty for tank failure due to improperly supported piping or incorrect installation.

### **CONNECT THE EFFLUENT PLUMBING**

The effluent plumbing must be the same size or larger than the nozzle size on the equipment. Do not reduce the size of the effluent piping as this might cause hydraulic overloading of the equipment. Also, try to run the discharge piping as short a distance as possible, through as few changes of direction as possible and at a pitch of not less than 1/16" per foot.

### **CONNECT THE INFLUENT PLUMBING**

The influent plumbing must be the same size as the nozzle size on the equipment for a minimum of 20 pipe diameters. Do not reduce the size of the influent piping as this might cause inappropriate velocities before it enters the unit. Also, try to run the inlet piping as short a distance as possible, through as few changes of direction as possible and at a pitch of not less than 1/16" per foot.

### **CONNECT THE SLUDGE DRAW-OFF PLUMBING**

Connect a valve to the sludge draw-off flange and run a short length of pipe to a place where the sludge can be periodically decanted. When selecting a valve make sure that it is suitable for use with the type of sludge collected in your unit. Plumb up all sludge draw off nozzles for best evacuation of accumulated sludge. This includes the fittings on both sides of the sludge hopper.

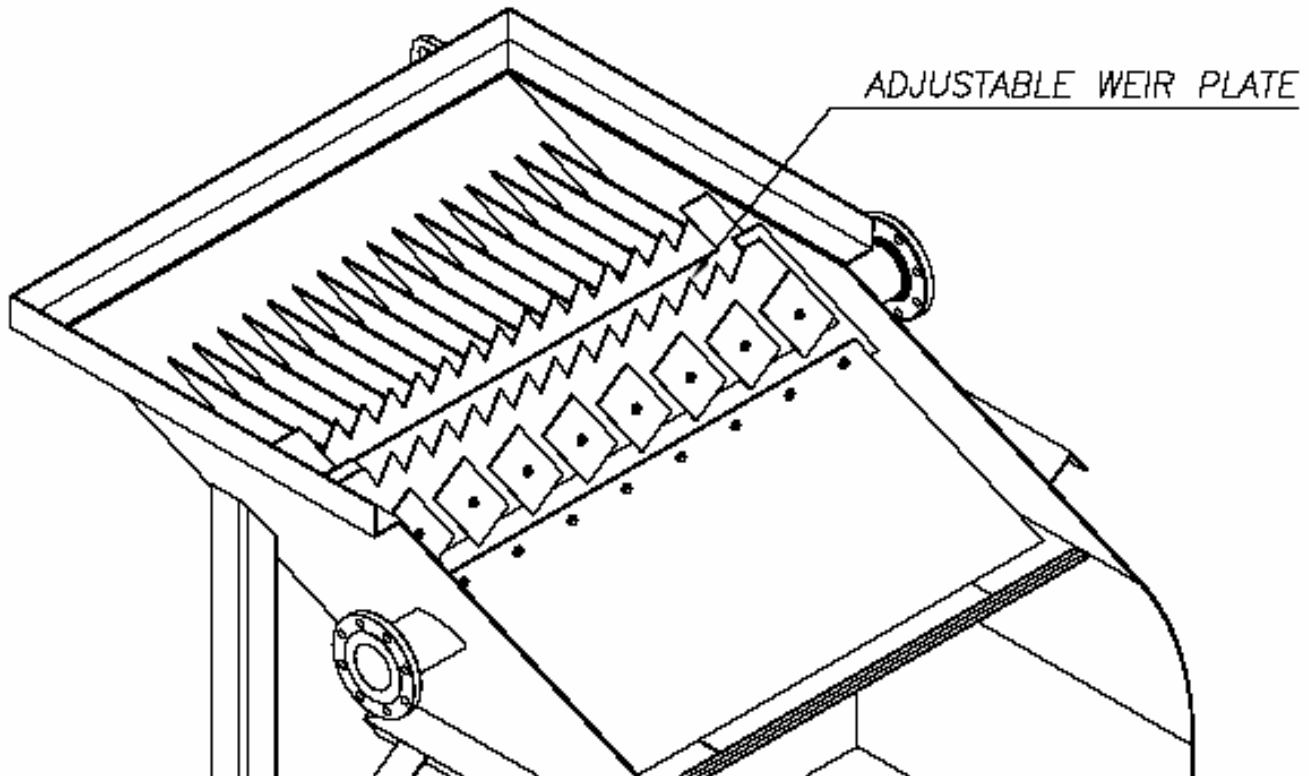
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## SECTION 2.05      EFFLUENT TROUGH ADJUSTMENT

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Each unit is supplied with adjustable, stainless steel v-notch weirs. The weirs and media packs will be shipped installed. Field adjustment will be required in order to level the water in the spilling into the effluent trough.

Loosen the bolts and adjust the weir plate until the water level is even at each v-notch in the plate.



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## SECTION 2.06      ELECTRICAL CONNECTIONS

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**SAFETY FIRST! Never perform any work or make any adjustments to ANY mechanical or electrical system without first disconnecting and locking out power to the unit or serious injury can result.**

Refer to project specific electrical drawing for all required field connections.

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## SECTION 2.07      MECHANICAL

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**SAFETY FIRST! Never perform any work or make any adjustments to ANY mechanical or electrical system without first disconnecting and locking out power to the unit or serious injury can result.**

**Prior to sustained operation, bump all motors to ensure proper rotation.**

The unit may be equipped with a mechanical sludge auger/thickener. These units will be equipped with a gearbox for speed reduction. The standard gear reducers are maintenance free and may be installed in any position.

<b>SECTION III      PRINCIPAL OF OPERATION</b>
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Hydro-Flo Technologies, Inc. Clarifier systems utilize inclined plate media packs in order to greatly increase the amount of projected surface area available in a given footprint. The solids removal efficiency of the clarifier is directly proportional to the amount of projected surface area offered and translates to an overflow ratio of GPM/ft<sup>2</sup>. A default overflow ratio is less than or equal to 0.25 GPM/ft<sup>2</sup>.

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## SECTION 3.01      SLUDGE REMOVAL

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Please consult your local city and state regulatory agency regarding specific requirements on the proper disposal of the sludge generated in your process.

If you need help with the disposal or treatment of the collected sludge, please contact your local HYDRO-FLO TECHNOLOGIES representative.

Sludge removal is very important to the proper operation of your Clarifier. Draw off the settled sludge regularly. Do not allow it to accumulate.

If left un-maintained, the sludge level will rise to a point where it will interfere with the operation of the media packs. Any settled sludge should be drawn off periodically according to the accumulation rate, typically at the beginning or end of each shift. This will prevent any major sludge related maintenance problems.

If your system was supplied with a sludge auger/thickener it should be allowed to operate continuously or nearly continuously, as it will assist in preventing the sludge from naturally compacting in the sludge chamber.

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## SECTION 3.02      EFFLUENT QUALITY

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Regularly check the effluent quality of your unit. If you notice any loss in effluent quality, take steps to correct the situation immediately. Some areas to check if your effluent quality has deteriorated are:

1. Have you exceeded the unit's maximum rated flow?
2. Have the influent characteristics changed due to some process change upstream?
3. Are you chemically treating before the unit and if so have these chemicals changed?
4. Are the chemicals being used for treatment completely mixed and are they fresh?
5. Has the sludge collected to the point where it has begun to interfere with the media packs?
6. Have you introduced anything new or foreign into the waste stream?

<b>SECTION IV</b>	<b>MAINTENANCE</b>
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**SECTION 4.01 COATING MAINTENANCE**

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Touch up all damaged coatings immediately. Regularly inspect the coatings for damage or degradation and repair immediately to prevent severe damage. See the specification information for this particular piece of equipment for proper procedures for coatings touchups for the coatings applied to this equipment. Pay particular attention to coatings condition and perform touchups after installation of any accessory equipment such as mixers, electrical, and media plate packs.

**Typical Coating Specifications**

- 1) Interior surfaces are to be blasted to a SSPC SP-10 near white metal blast.
- 2) Exterior surfaces are to be blasted to a SSPC-SP-6 commercial blast.
- 3) All threads and gaskets are to be masked before blasting and coating application. Remove all masking materials prior to shipment.
- 4) All coatings are to be applied in strict accordance with manufacturer's specifications.

**Hydro-Flo Technologies Interior Paint Standard**

Brand: International – No Substitute

Name: Interseal 670 HS, 1-2 Coats (10-12 Mil Total DFT)

Activator: Low Temperature Activator

**Hydro-Flo Technologies Exterior Paint Standard**

Brand: DuPont – No Substitute

Primer: Corlar 2.1 ST White Epoxy Mastic (3 Mil DFT Minimum)

Top Coat: Imron 2.8 HG High Gloss Polyurethane (1-1/2 Mil DFT Minimum)

Color: Safety Blue

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**SECTION 4.02 RECOMMENDED PERIODIC MAINTENANCE TABLE**

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<b>MAINTENANCE TASK</b>	<b>RECOMMENDED MAINTENANCE SCHEDULE</b>
Check chemical supplies (if used) and replenish as needed.	AS REQUIRED Daily if possible.
Remove accumulated sludge from the sludge collection chamber.	AS REQUIRED Daily if possible.
Check for proper operation of the sludge auger/thickener (if supplied).	AS REQUIRED Daily if possible.
Check auger drive shaft seal. Tighten enough to eliminate excessive leaking.	AS REQUIRED Weekly if possible.
Drain unit and inspect interior coatings. Touch up as necessary.	Annually



## SECTION V

## SLUDGE AUGER

If the unit comes equipped with a sludge auger/thickener device it will be powered by an electric motor connected to a gearbox for speed reduction to the auger shaft. The gearbox is maintenance free and may be mounted in any position.

The auger shaft enters the tank directly adjacent the auger drive motor. The shaft incorporates a stuffing box type seal with a compression gasket and two mounting studs with gland seal nuts. The stuffing box seal will wear over time and begin to drip excessive water. The stuffing box seal will require tightening of the gland seal nuts to reduce leaking. When you tighten the gland seal nuts you must tighten them no more than ½ turn each and check for leaking while the shaft is turning. Never tighten more than ½ turn without checking for leaking.