

## FRP Density Current Baffle Systems

Corrosion Resistance    Superior Strength    Long Service Life

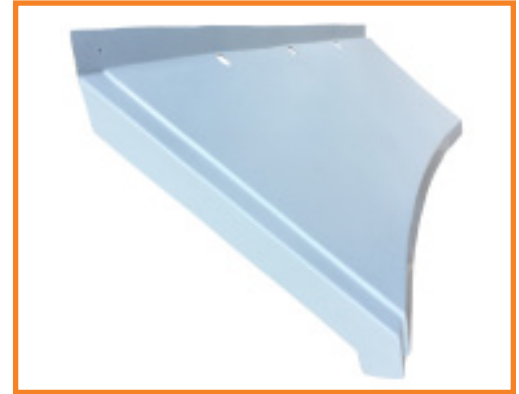
As an integral part of activated sludge clarifiers, Enduro Density Current Baffles meet or exceed industry standards for units commonly known as “Stamford”, “Submerged Flow Deflection”, or “Upflow” baffles. The custom designed fiberglass baffles from Enduro Composites provide important value to water and wastewater operations by delivering:

### Long, Reliable Service

Long service life for the baffle is ensured by FRP components with superior corrosion resistance and strength. Utilizing precision molding results in consistent, reliable quality and components custom molded to fit the contour of each clarifier.

### Easy, low cost installation

With simple, modular construction, installation is quick and easy. Lightweight components, with high strength to weight properties, are easy to handle and do not require special lifting equipment. Stainless steel or FRP support brackets are easily attached in the field by the contractor to ensure proper installation. Only one bracket per panel is needed for most applications.



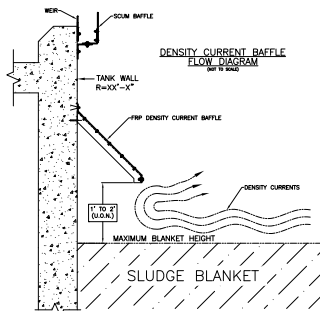
### Process Functionality

- Improved solids capture and reduced turbidity
- Increased hydraulic capacity

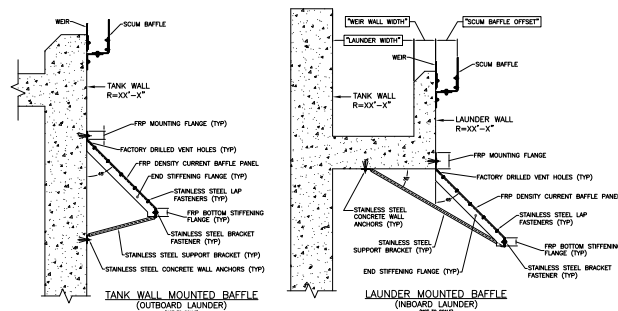
Formed by influent flows entering the clarifier, dense currents race out across the tank above the sludge blanket effectively disturbing lighter solids on top. Left unchecked, currents collect those solids and deposit them over the weir into the effluent stream, thereby “short circuiting” the clarification process and reducing hydraulic capacity of the tank.

By redirecting density current flows back to the center of the tank (Detail A), Enduro Density Current Baffles allow flows to decelerate away from the effluent stream and redeposit suspended solids back onto the sludge blanket where they belong.

DETAIL A – FLOW DIAGRAM



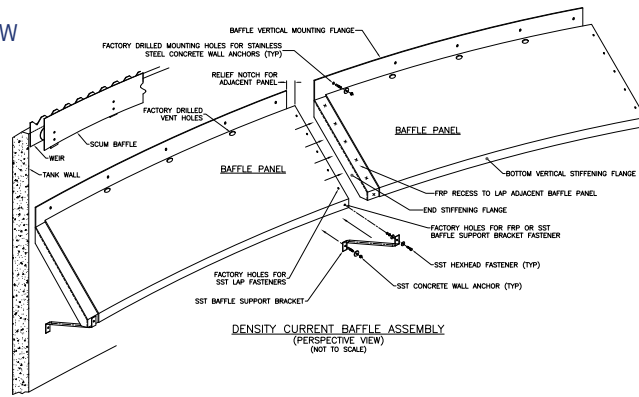
DETAIL B – TYPICAL MOUNTING OPTIONS



Studies demonstrate Density Current Baffles can reduce total suspended solids (TSS) by nearly 40% or more in some cases. This is best achieved by:

1. Mounting baffle below effluent launder, weir and scum baffle (Detail B).
  - Outboard launders: Locate bottom of baffle halfway between top of sludge blanket and bottom of weir.
  - Inboard launders: If vertical clearance between baffle bottom and top of sludge blanket is two feet or more, mount baffle on tank wall below launder without obstructing vents. If vertical clearance is less than two feet, mount baffle to lower inboard corner of launder trough. For this condition, calculating horizontal projection and baffle size should also include the launder width. Minimum size should be 24" diagonally.
2. Sloping baffle inward and downward beyond the scum baffle to redirect random density currents (flows toward center of tank).
3. Mounting baffle continuously around the tank to maximize solids capture.

DETAIL C – PERSPECTIVE VIEW



**SPECIFICATIONS: FIBERGLASS REINFORCED PLASTIC (FRP) DENSITY CURRENT BAFFLE**

**PART 1 - GENERAL**

**1.01 Description of Work**

The scope of this section shall include materials and installation for the fiberglass reinforced plastic (FRP) Density Current (Stamford) Baffle System, which includes FRP Density Current Baffle panels, supports and fasteners.

**1.02 Design Criteria**

- A. Density current baffles and associated FRP component materials shall comply with ANSI/AWWA Standards as applicable for wastewater treatment applications.
  - B. Baffle size and mounting location shall primarily be determined by clarifier configuration to maximize solids retention.
  - C. Baffle system shall be able to withstand buoyant forces equal to the weight of water acting below it during operation and shall be able to support its own weight plus snow and wind loads when tank is empty.
  - D. Vents shall be located near top of panel to relieve buildup of gases that may collect underneath the baffle.
  - E. The manufacturer relies on this information to provide an accurate arrangement for the baffle to function as intended. Design requirements, which vary, shall be specified by the consulting design engineer.
- Design Parameters (Imperial or Metric):  
 Tank design: \_\_\_Internal \_\_\_External Launder  
 Tank wall inner radius: \_\_\_\_\_  
 Weir wall inner radius (internal launder): \_\_\_\_\_  
 Side water depth (weir to tank floor): \_\_\_\_\_  
 Baffle mounting location: \_\_\_Wall \_\_\_Launder  
 Baffle outer radius: \_\_\_\_\_  
 Baffle inclination angle (from horizontal): \_\_\_\_\_  
 Baffle throw (distance from tank wall): \_\_\_\_\_  
 Sludge blanket depth (if known): \_\_\_\_\_  
 Obstructions: \_\_\_\_\_

**PART 2 - PRODUCTS**

**2.01 Manufacturer(s)**

A. Standard for design and characteristics shall be based on materials and components provided by Enduro Composites, Inc., Houston, TX (713) 358-4000, www.endurocomposites.com.

**2.02 Materials**

- A. FRP density current baffle panels and appurtenances shall be fiberglass reinforced plastic with uniform smooth surfaces free of voids and porosity, without dry spots, crazes or unreinforced areas.
- B. FRP Density current baffle panels shall exhibit these minimum properties:

Tensile Strength	12,000 psi	ASTM D 638
Flexural Strength	20,000 psi	ASTM D 790
Flexural Modulus	1.0 x 10 <sup>6</sup> psi	ASTM D 790
Izod Impact (Notched)	12.0 ft-lb/in	ASTM D 256
Water Absorption	.20% maximum	ASTM D 570
Barcol Hardness	40	ASTM D 2853
Coef. of Thermal Expansion	10.5 x 10 <sup>-6</sup> inch/inch °F	ASTM D 696

- C. Density current baffle panels shall include glass fiber reinforcements 40% (minimum) of the material weight embedded within UV Stabilized Type 1 – Polyester Resin. Color shall be standard gray.
- D. FRP material shall have a smooth resin rich top with surfacing veil against the mold and resin rich hot coat to the bottom side after sanding. Gel coat top surface is also available upon request.
- E. Factory cut edges and drilled holes shall be sealed with ANSI/NSF approved material.
- F. FRP resins shall be flame resistant and meet requirements of ASTM D 635 and ASTM E 84, Class 1 with flame spread rating of 25 or less (as applicable for wastewater applications).
- G. FRP Density Current Baffle Panels
  - 1. Panel size (nom.) shall be 1/4" thick x 8'-0" long (full dimension) to the "width" as determined for the maximum retention of solids (u.n.o.).
  - 2. Panel shall be designed and molded of fiberglass-reinforced polyester resin composite laminate to the tank curvature (if round) or straight (if rectangular), u.n.o.
  - 3. Horizontal upper mounting flange along top of the panel shall be 1/4" thick x 6" high x panel length on launder mounted applications and 1/4" thick x 3" high x panel length on wall mounted applications, u.n.o.
  - 4. Horizontal lower stiffening flange placed vertically shall be 1/4" thick x 3" high and shall include additional glass reinforcing along the length of the panel for baffles over 36" wide.
  - 5. For additional strength and rigidity between adjacent panels, the design shall include a 3" flanged recessed end to form a continuous flush, top surface around the tank across the entire installation.
  - 6. Panel shall slope inward and downward from the mounting location to resist solids build-up on the baffle.
  - 7. All panel edges, mounting holes and top surface lap holes shall be factory drilled and sealed with resin.
  - 8. Mounting and assembly fasteners shall be stainless steel concrete anchors or hex bolt type fasteners.

**H. Hardware**

- 1. Fasteners, anchorage, and other structural hardware provided by the manufacturer shall be: \_\_\_304 \_\_\_316 Stainless Steel.
- 2. Baffle lap fasteners shall be nut and bolt type assembly with washers and lock washer.
- 3. Mounting anchors shall be expansion (wedge) type or adhesive type sized as required.

**PART 3 – EXECUTION**

**3.01 Installation**

- A. System shall be installed per sequence and instructions shown on the approved drawings.
- B. Installer shall field cut materials only as directed by Enduro Composites. Field modifications are not allowed without the manufacturer's written approval.
- C. Installer shall seal field cut edges and drilled holes with an approved resin (NSF compatible if required).