

## Floating Baffle System Specification

### **1.0 General Description**

- 1.1 The floating baffles described in this specification shall be a custom manufactured factory prefabricated hydraulic barrier curtain delivered on site in a state of completion such that no further fabrication is required for installation. The floating baffles shall depend on upper tension and bottom ballast members for maximum resistance to loads encountered in industrial or municipal lagoons. The manufacturer shall utilize virgin quality elastomeric geomembrane materials and factory dielectric and thermal seaming processes throughout. The floating baffles shall be designed for ease of installation in a new or operating lagoon without requiring de-watering.

### **2.0 Scope**

- 2.1 Furnish and install Floating Baffles with appurtenances necessary to complete work as directed in the project specifications and drawings.

### **3.0 Manufacturer Requirements**

- 3.1 The diversion curtains shall be equivalent in all respects to the **Director I™** series Floating Baffles manufactured by Environetics, Inc., Lockport, IL, Phone: 815-838-8331.
- 3.2 Qualified manufacturers must have at least 20 years experience in the fabrication of geomembrane products and must have manufactured a minimum of 50 floating baffle projects for lagoon applications.
- 3.3 Alternate manufacturers wishing to pre-qualify shall submit to the engineer, no later than 15 days prior to the bid date, a list of floating baffle projects with detail drawings meeting the requirements of this project specification.

### **4.0 Components**

#### **Baffle Curtain Material**

The floating baffles shall be fabricated from polyester reinforced polymeric alloy membrane material ENV-3004-12 (30 Mil Polyester Reinforced Ethylene Interpolymer Alloy). Any proposed substitution must be approved by the Engineer.

#### **4.1 Baffle Curtain Material**

The tank baffle curtains shall be fabricated from polyester reinforced geomembrane material ENV-3004-12 (30 Mil XR®-5 8130). Any proposed substitution must be approved by the Engineer.

##### **4.1.1 Material Properties**

<b><u>Physical Properties</u></b>	<b><u>Test Method</u></b>	<b><u>Standard</u></b>
Base Fabric Type	ASTM D751	Polyester
Base Fabric Weight (nominal)	ASTM D751	6.5 oz/yd <sup>2</sup>
Thickness	ASTM D751	30.0 mils. min.

Finished Coated Weight	ASTM D751	30.0 ± 2 oz/yd <sup>2</sup>
Tear Strength	ASTM D4533 Trapezoid Tear	40/55 lb. min.
Breaking Yield Strength	ASTM D751 Grab Tensile	550/550 lb. min.
Low Temperature Resistance	ASTM D2136, 1/8-in. mandrel, 4 hrs.	Pass @ -30° F
Dimensional Stability	ASTM D1204 212°F - 1 hour	0.5% max. each direction
Adhesion-Heat Sealed Seam	ASTM D751, Dielectric Weld	40 lb./ 2-in. min.
Dead Load Seam Strength	ASTM D751 4 Hour test	2 in seam, 4 hours, 1 in strip Pass 240 lb. @ 70° F Pass 120 lb. @ 160° F
Bursting Strength	ASTM D751 Ball Tip	750 lb. min
Hydrostatic Resistance	ASTM D751, Procedure A	800 psi. min.
Blocking Resistance	ASTM D751 180° F	#2 Rating max
Adhesion - Ply	ASTM D413, Type A	15 lb./in. min. or Film Tearing Bond
Bonded Seam Strength	ASTM D751 Grab Test Method Procedure A	550 lb. min.
Abrasion Resistance	ASTM D3389, H-18 Wheel, 1kg Load	2000 cycles (min) before fabric exposure 50 mg/100 cycles maximum weight loss
Weathering Resistance	ASTM G153 (Carbon-Arc)	8000 hrs. (min)- No appreciable changes or stiffening or cracking of coating
Water Absorption	ASTM D471 Section 12, 7 days	0.025 kg/m <sup>2</sup> max @ 70°F. 0.14 kg/m <sup>2</sup> max @ 212°F.
Wicking	ASTM D751	1/8-in max.
Puncture Resistance	ASTM D4833	275 lb. min.
Coefficient of Thermal Expansion/Contraction	ASTM D696	8 x 10 <sup>-6</sup> in/in/°F max.
Puncture Resistance	FED-STD 101C Method 2031	350 lb. (approximate)

4.1.2 Nylon reinforced materials will not be acceptable. The nylon reinforcing fabric will absorb water through the exposed scrim causing swelling and material delamination.

4.1.3 Baffles shall conform to the side slopes of lagoon where they meet the berm.

4.1.4 All seams shall be welded. Sewn seams are not recommended by the material manufacturer.

#### 4.2 Upper Tension & Bottom Ballast Members

4.2.1 The end of the baffle shall be terminated with two (2) each: 1/8-in. by 2-in. by 12-in. [3mm by 50mm by 304mm] (min.) stainless steel bolt-through end-connect plates attached to baffle collar with five (5) each: 5/16-in. [8mm] diameter by 1-3/4-in. [44mm] stainless steel bolt, washer, lock washer and nut. The baffle collar material shall be terminated beyond end-connect plates with a 3/8-in. [9mm] diameter pullout stop encapsulated in the baffle collar material.

- 4.2.2 The floating baffle manufacturer shall provide a continuous upper tension member from shore to shore consisting of a minimum 1/4-in. [6mm] diameter vinyl coated stainless steel aircraft cable seamed in a hem under the flotation collar.
- 4.2.3 The floating baffle manufacturer shall provide a bottom ballast member consisting of a 5/8-in. [16mm] diameter hot-dip galvanized (HDG) steel proof-coil chain seamed in a hem at the bottom edge of the hydraulic curtain.
- 4.2.4 Lead ballast will not be acceptable. The US Environmental Protection Agency (EPA) and the Center for Disease Control and Prevention (CDC) have determined that lead is harmful to human health.

#### **4.3 Flotation Collar**

- 4.3.1 The flotation collar shall be constructed using a minimum 6-in. diameter by 8-ft. long polystyrene foam logs sealed in a chamber of the specified baffle curtain material. The flotation material shall be closed cell polystyrene foam (1 lb. per cubic foot minimum foam density) providing a minimum buoyancy of 60 lbs. per cubic foot.
- 4.3.2 External, mechanically attached flotation that may require a spare part inventory will not be acceptable.
- 4.3.3 A maximum of 6-in. freeboard will be allowed to minimize exposure to wind and to prevent baffle displacement.

#### **4.4 Baffle Sections**

- 4.4.1 The floating baffles will be manufactured in single units which shall arrive on site ready to install up to 300-ft. in length. Multiple section baffles with field assembly required will only be acceptable for baffles over 300-ft. in length.

#### **4.5 Flow Through Windows**

- 4.5.1 Flow through window or flow around area should equal a minimum of 1 square foot per 30 GPM of peak flow rate.
- 4.5.2 A 2-in. wide reinforcement strip of the specified curtain material shall be welded around the perimeter of the flow through window.

#### **4.6 Mid-Lagoon Anchoring**

- 4.6.1 To maintain the baffle position in the lagoon, the baffle manufacturer shall provide mid-lagoon anchoring hardware. Mid-lagoon anchor hardware shall be attached to the under-collar cable at specified intervals. The mid-lagoon anchor hardware shall be secured with 1/4-in. diameter vinyl coated stainless steel aircraft cables at a three to one (3:1) slope to 100 lb. (min.) concrete anchors at the bottom of the lagoon located perpendicular to the flotation collar.
- 4.6.2 Mid-lagoon anchoring hardware shall be provided as a standard accessory on all baffles that exceed 200-ft. in length. Typical mid-lagoon anchor spacing is 100-ft. on center.

## **5.0 Execution**

### **5.1 Verify Field Dimensions**

- 5.1.1 The installation contractor shall verify field dimensions of the lagoon at the baffle location prior to releasing the job for production.
- 5.1.2 Measure the distance from shore to shore at the high-water level.
- 5.1.3 Depth measurements are to be taken at the high-water level.
- 5.1.4 The depth measurements can be taken from a boat.
- 5.1.5 The operator follows the line where the baffle will be installed and uses a rod to gauge the depth of the lagoon at ten-foot intervals.
- 5.1.6 The length and depth measurements are sent to Environetics where they are used to create a profile for the baffle that will fit the lagoon profile.

### **5.2 Installation**

- 5.2.1 The installation contractor shall install the floating baffle in the position shown on the project drawings.
- 5.2.2 The floating baffle shall be installed in accordance with the manufacturer's drawings, instructions and recommendations.
- 5.2.3 The contractor shall supply and install all necessary bottom anchors and berm anchor posts.
- 5.2.4 The manufacturer shall provide remote technical support to ensure proper installation of the baffle system.
- 5.2.5 The manufacturer shall, upon request, provide on-site technical support for additional cost to ensure proper installation of the baffle system.

### **5.3 Warranty**

- 5.3.1 Floating baffles shall have a limited two (2) year warranty from the date of shipment covering workmanship and materials. All warranties must be submitted in writing by the manufacturer and confirmed by the end user.

**PLEASE NOTE: UNDERLINED TEXT IN THE BODY OF THIS SPECIFICATION ARE OPTIONS AND REQUIRE SELECTION INPUT FROM THE PROJECT ENGINEER.**

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