

SECTION _____
POLYPROPYLENE FABRIC BAFFLE WALL SPECIFICATION

PART 1 – GENERAL

1.01 WORK INCLUDED

- 1.01.1 This specification covers the design, fabrication, and erection of tension-fabric baffle systems composed of NSF 61 compliant polypropylene membrane RPP45 as manufactured by Carlisle Syntec Incorporated of Carlisle, Pennsylvania for the storage tank as shown on the contract drawings and specified herein.
- 1.01.2 The tank contractor shall furnish all labor, materials, and equipment required to design, fabricate, deliver and install the tensioned-fabric baffle system.

1.02 SHOP DRAWINGS AND SUBMITTALS

- 1.02.1 Before executing any of the work in this section, prints or drawings shall be submitted to the ENGINEER showing dimensions, sizes, thickness, gauges, materials, finishes, joints, attachment, anchorage, and erection procedures.

1.03 EXPERIENCE REQUIREMENTS

- 1.03.1 The baffle fabricator shall have furnished and had in satisfactory service for a period of not less than 5 years, at least 10 baffle systems with dimensions and quantities similar to the one specified for this project. The fabricator shall submit evidence of such with his submittal.

1.04 GUARANTEE

- 1.04.1 The baffle system shall be guaranteed for a period of 1 year from final acceptance against defective materials and workmanship.

1.05 WARRANTY

- 1.05.1 The geo-membrane manufacturer shall confirm in writing, that the material to be furnished will be free of defects in materials and workmanship at the time of the sale, and against deterioration due to effects of ozone, ultraviolet or other normal weathering on a pro-rated basis for up to 20 years from the date of completed installation. Manufacturer shall furnish a sample warranty for review and approval prior to shipment.

PART 2 – PRODUCTS

2.01 DESIGN REQUIREMENTS

- 2.01.1 The baffles shall conform to the specified dimensions and shall be designed for installation in potable water with chlorine and ammonia present in the tank. The baffle system shall be suitable for expected water levels with daily fluctuations and shall have adequate strength to resist 0.5 inch of water depth difference across the baffle.
- 2.01.2 The baffles shall be erected and anchored to the floor, walls, and roof as shown in the plans to provide a flow path for maximum contact time for potable water in the tank.

2.02 FABRIC

- 2.02.1 The fabric shall be listed by NSF 61 as being acceptable for use in potable water. The fabric shall consist of two (2) plies of polypropylene laminated over one (1) ply of reinforcing fabric. The reinforcing fabric shall be a 9 x 8 count utilizing 1000 denier weft in sorted polyester fabric.
- 2.02.2 The fabric shall be good appearance and free of all defects such as holes, tears, blisters, and any other defects that may affect its serviceability.
- 2.02.3 The coated fabric shall not be less than 45 mils thickness. The polypropylene shall fully encapsulate the fabric and extend a minimum of 1/8" beyond the reinforcing scrim roll edges.
- 2.02.4 The coated fabric shall be UV stable in order to possess maximum UV resistance when exposed to the atmosphere for extended periods of time.
- 2.02.5 The fabric be 45 mil in thickness and shall meet or exceed the following minimum physical properties:

<u>Physical Property</u>	<u>Test Method</u>	<u>Minimum Physical Properties</u>
Tolerance on nominal thickness, %	ASTM D 5199	± 10
Thickness over scrim, in.	ASTM D 4637 Optical Method	0.013 min.
Mass per unit area, lb/ft ²	ASTM D 5261	0.21
Breaking Strength, lbf (grab tensile at strain rate of 12 in./min.)	ASTM D 751 Grab Method A	250
Elongation at break of fabric, %	ASTM D 751	25 typical
Tearing Strength, lbf (2 in. / min. strain rate)	ASTM D 5884 (max load)	55 min 100 typical
Low temperature flexibility, °F	ASTM D 2136	-40 max.

	1/8 in. mandrel 4 hour @ temp.	-50 typical
Ozone resistance, 100 pphm, 168 hours	ASTM D 1149	No cracks
Resistance to water (distilled) Absorption, after 30 days immersion 122 °F Change in mass, %	ASTM D 471	1.0 max. 0.5 typical
Hydrostatic Resistance, lbf/in ² of psi (Mullen burst)	ASTM D 751	450 typical
Field seam strength, ibf/in.	ASTM D 4437	30 min.
Seam tested in peel after weld	1 in. wide	60 typical
Puncture resistance, lbf	ASTM D 4833	110 typical
Resistance to Xenon-arc	ASTM G 155	No cracks
Weathering, Xenon-Arc, 10,080 hJ/m ² total radiant Exposure, visual condition at 10X	0.70 W/m ² 80 °C B.P.T.	No loss of breaking or tearing strength

2.03 FASTENERS AND HARDWARE

- 2.03.1 All bolts, washers, nuts, and expansion anchors shall be type 316 stainless steel, minimum 3/8-inch diameter.
- 2.03.2 Batten connection shall be shall be type 316 stainless steel flat bar, minimum 1/4-inch thickness by 2 inches wide.
- 2.03.3 Floor and Wall connection shall be type 316 stainless steel angle clips, minimum 1/4-inch thickness by 2 inches wide by 2 inches wide by 2" long; type 316 stainless steel angle, minimum 1/4-inch thickness by 2 inches wide by 2 inches wide; and type 316 stainless steel flat bar, minimum 1/4-inch thickness by 2 inches wide.
- 2.03.4 Suspension and Tension for the top and open ends of the curtain(s) shall be type 316 stainless steel 3/16" diameter cable with type 316 stainless steel 3/16" cable clamps and thimbles.

PART 3 – EXECUTION

3.01 COORDINATION

- 3.01.1 The baffle manufacturer shall coordinate with the Engineer and the tank manufacturer concerning loading on the reservoir, attachment details, and the sequence of construction. Installation details are shown on the plans are provided as a guide for the contractor and baffle manufacturer.
- 3.01.2 The tank contractor shall provide thickened areas beneath the membrane slab as required for securing the base of the baffle tp the concrete floor if applicable.

3.02 PREPARATION AND FABRICATION

- 3.02.1 Prior to factory seaming, all roll goods shall be inspected. All factory seams shall be made by thermal fusion methods. All factory seams shall have a minimum

scrim-to-scrim overlap of one and one-half inches (1-1/2") when fabricated. Fabricated seams found to have less than the specified minimum overlap shall be repaired by adding an overlap or cap strip that provides the minimum specified overlap or will be rejected. All seams shall be made so that thermal fusion bond extends fully along the width of the sheet so that no loose edges are present.

3.02.2 Prior to installation, all unnecessary material and equipment shall be removed from the tank and the floor slab installation areas shall be swept clean.

3.03 INSPECTION

3.03.1 All sheets and seams shall be 100% visually inspected during fabrication. No defective seams or exposed scrim will be allowed. All exposed scrim edges shall be sealed with an approved polypropylene edge sealant or capped with a strip of unreinforced polypropylene. All indicated repairs shall be made by the geomembrane fabricator before the panels are packaged for shipment.

3.03.2 In addition to visual inspection, a 48-inch (1.2m) weld sample shall be made with each factory seam welding unit used in this work at the beginning of every work shift and every four hours of production thereafter. Sample shall be taken from a seam specifically made for quality testing and not taken from the fabricated panel itself. Test specimens shall be cut at quarter points from each 48-inch seam sample (a total of three places) and tested for seam strength and peel adhesion. The shear seam strength shall be tested in accordance with ASTM D751 as modified in Annex A of ANSI/NSF 54. The peel adhesion shall be tested in accordance with ASTM D 4437 as modified in Annex A of ANSI/NSF 54.

3.03.2.1 A log shall be maintained showing the date, time, panel number and test results. Failure of the material and/or seams to meet all the requirements of these specifications may be cause for rejection of the material and/or seams as appropriate. The Fabricator shall provide the test results to the Owner or Engineer upon request.

3.03.3 Upon completion of baffle wall installation, contractor shall visually inspect the baffle walls for damage from ground level. Any repairs shall be made with newly manufactured material cut with rounded corners extending 4-inches in each direction from the damaged area. The entire repair shall be completely welded to the baffle wall.

3.04 INSTALLATION

3.04.1 CONTRACTOR shall field verify dimensions and provide the field dimensions to the baffle curtain fabricator prior to fabrication of the baffle curtains.

3.04.2 All work shall be fabricated and erected in accordance with the approved submittal drawings. For those baffles requiring widths greater than the coated

fabric available from the manufacturer, a thermal fusion heat seam nominal 2 inches wide shall be used at those locations to join multiple widths of fabric together. The strength of the seam shall be as great as or greater than the parent material in shear strength.

3.04.3 Baffle shall be secured to the floor with type 316 Stainless Steel Angles with type 316 stainless steel expansion anchors only in the cases the floor of the tank is concrete. All baffle penetrations shall be punched. Provide 3/8-inch polypropylene rope in the 4" wide, double hem on the perimeter of the baffle curtain(s). The 3/8-inch polypropylene rope inside the 4" wide hem shall be behind the stainless steel plates at floor locations.

3.04.4 Provide stainless steel pipe and stainless steel angle plates; or stainless steel flat plates sandwiching the baffle curtain on the top edge and open end of the baffle wall with 3/8-inch bolts for attaching the baffle to the top and the open end wall of the tank as shown on the drawings.

3.04.5 Provide carbon steel 1/4" x 2" x 2" x 2" plates to be attached to the ceiling, the walls, and the floor of the tank for securing the baffle curtain to the tank wall using additional stainless steel flat bar and bolts. An insulation component must be used to separate the unlike metals.

3.04.6 Provide carbon steel 1/4" x 2" x 2" x 2" plates to be attached to the ceiling and the open end wall of the tank for securing the baffle curtain to the tank wall the type 316 stainless steel 3/16" diameter cable from the tank wall to the top edge or open end of the baffle curtain to tension or suspend the baffle curtain. The type 316 stainless steel 3/16" diameter cable shall be secured using type 316 stainless steel 3/16" cable clamps. An insulation component must be used to separate the unlike metals.

3.04.7 Hardware and fasteners shall be made of type 316 stainless steel.

3.04.8 All of the carbon steel metals must be epoxy painted after the metals have been welded and the edges have been ground smooth.

3.05 START-UP AND TRAINING

Not applicable.

END OF SECTION